NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

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1 What is the principal business activity at your location? (check one only)

01.☐ Manufacturing (other)
02.☐ Finance/Banking
03.☐ Insurance/Real Estate/Legal
04.☐ Health Care Services
05.☐ Hospitality/Entertainment/Recreation
06.☐ Media/TV/Cable/Radio/Print
07.☐ Retail/Wholesale Trade/Business Services
08.☐ Transportation
09.☐ Utilities
10.☐ Education
11.☐ Process Industries (Mining/Construction/ Petroleum Refining/Agriculture/Forestry)
12.☐ Government (Federal/State/Local)
13.☐ Military
14.☐ Aerospace
15.☐ Consulting (Independent)*
16.☐ Carriers/Interconnects
17.☐ Internet Service Provider (ISP)
18.☐ Manufacturing (Computer/Communications/OEM)
19.☐ Resellers of Computer/Network Products (VARs, VADs)
20.☐ Systems/Network Integrators*
21.☐ Distributors (Computer/Communications)*
22.☐ Other (please specify)____________

***Please complete form based on largest client.**

2 What is your job function? (check one only)

NETWORK IS MANAGEMENT:

1. ☐ Network Management
2. ☐ LAN Management
3. ☐ Datacom/Telecom Management
4. ☐ IS, IT, MIS, CIO, Systems Management
5. ☐ Internet/Intranet Management/Webmaster
6. ☐ Engineering Management
7. ☐ Corporate Management (CEO, Pres., VP, Dir.,Mgr., Financial Management)
8. ☐ Consultant (Independent)
9. ☐ Other (please specify)____________

3 What is the estimated value of Network equipment and services that you specify, recommend or approve the purchase of? (Please print the appropriate number code in the box next to each product category. Please complete ALL categories A-M.)

9. $100 Million or more
0. $50 Million to $99.9 Million
2. $25 Million to $49.9 Million
3. $10 to $24.9 Million
4. $1 to $9.9 Million
5. $100,000 to $999,999
6. $50,000 to $99,999
7. Under $50,000
8. None of the above

A ☐ Large Systems (Mainframes/Minis)
B ☐ Desktops (Micros/Laptops/Workstations)
C ☐ Servers
D ☐ LANs
E ☐ WAN Equipment
F ☐ Carrier Services
G ☐ Internetworking
H ☐ Internet
I ☐ Intranet
J ☐ Remote Access
K ☐ Peripherals
L ☐ Software
M ☐ Service/Support

4 What is the total number of sites for which you have purchase Influence? (check one only)

1.☐ 100+ 2.☐ 50 - 99 3.☐ 20 - 49 4.☐ 10 - 19 5.☐ 2 - 9
6.☐ 1 7.☐ None

8 Please indicate the products/services that you are currently involved in purchasing or plan to purchase: (Check ALL that apply)

A. Currently involved in purchasing **B. Plan to purchase**

INTERNET/INTRANET

A B
☐ 01. ☐ Internet Services
☐ 02. ☐ Firewalls/Security/Encryption
☐ 03. ☐ Internet Web Servers
☐ 04. ☐ Intranet Web Servers
☐ 05. ☐ TCP/IP Software
☐ 06. ☐ Management/Monitoring Software
☐ 07. ☐ Push Technology
☐ 08. ☐ Web Browsers
☐ 09. ☐ Intranet Applications/Groupware
☐ 10. ☐ Search/Retrieval Products (web crawler)
☐ 11. ☐ Internet Development Tools (JAVA, ActiveX, etc.)
☐ 12. ☐ Electronic Commerce Tools
☐ 13. ☐ Internet Telephony

LOCAL-AREA NETWORKS

A B
☐ 14. ☐ Local-Area Networks
☐ 15 ☐ Network Operating System Software
☐ 16. ☐ Servers
☐ 17. ☐ Print Servers
☐ 18. ☐ ATM Switches
☐ 19. ☐ Token-Ring Switches
☐ 20. ☐ Ethernet Switches
☐ 21. ☐ Fast Ethernet
☐ 22. ☐ Gigabit Ethernet
☐ 23. ☐ IP Switches
☐ 24. ☐ LAN Storage/Backup
☐ 25. ☐ Optical LAN Storage/Backup
☐ 26. ☐ Disk LAN Storage/Backup
☐ 27. ☐ Tape LAN Storage/Backup
☐ 28. ☐ RAID LAN Storage/Backup
☐ 29. ☐ Network Test/Diagnostic Tools
☐ 30. ☐ Cables, Connectors, Baluns
☐ 31. ☐ UPS
☐ 32. ☐ Network Interface Cards
☐ 33. ☐ SNMP Network Management

INTERNETWORKING

A B
☐ 34. ☐ Routers
☐ 35. ☐ Hubs
☐ 36. ☐ Intelligent Hubs
☐ 37. ☐ Stackable Hubs
☐ 38. ☐ Bridge/Router
☐ 39. ☐ Bridges
☐ 40. ☐ Gateways
☐ 41. ☐ Concentrators/Repeaters

COMPUTERS/PERIPHERALS

A B
☐ 42. ☐ Network Computers
☐ 43 ☐ Laptops/Notebooks/Sub-Notebooks
☐ 44. ☐ Micros/PCs
☐ 45. ☐ Minis
☐ 46. ☐ Mainframes
☐ 47. ☐ Workstations
☐ 48. ☐ Printers/Network Printers
☐ 49. ☐ CD-ROM
☐ 50. ☐ Fax/Modem Boards
☐ 51. ☐ Graphics/Multimedia/Audio/Video Boards
☐ 52. ☐ Memory/Chips/Boards/Cards

REMOTE/WIRELESS COMPUTING

A B
☐ 53. ☐ Remote Access Products
☐ 54. ☐ Remote Access Services
☐ 55. ☐ PDAs
☐ 56. ☐ PCMCIA Devices
☐ 57. ☐ Wireless Data Services
☐ 58. ☐ Wireless Data Equipment
☐ 59. ☐ Cellular Equipment & Services

SOFTWARE/APPLICATIONS

A B
☐ 60. ☐ Network Management
☐ 61. ☐ Systems Management
☐ 62. ☐ Security
☐ 63. ☐ Communications Software
☐ 64. ☐ Terminal Emulation
☐ 65. ☐ Operating Systems
☐ 66. ☐ Applications Development Tools
☐ 67. ☐ Database Management/RDBMS
☐ 68. ☐ Groupware
☐ 69. ☐ Workflow
☐ 70. ☐ EDI
☐ 71. ☐ E-mail
☐ 72. ☐ Desktop Video Conferencing
☐ 73. ☐ Imaging
☐ 74. ☐ Suites/Server Suites (Back Office, etc.)
☐ 75. ☐ Middleware
☐ 76. ☐ Document Management
☐ 77. ☐ Site Metering Tools
☐ 78. ☐ Computer Telephony Integration (CTI)
☐ 79. ☐ Data Warehousing

WIDE-AREA NETWORK EQUIPMENT & SERVICES

A B
☐ 80. ☐ Modems
☐ 81. ☐ Asynchronous Transfer Mode (ATM)
☐ 82. ☐ Frame Relay Equipment/Services
☐ 83. ☐ ISDN Equipment & Services
☐ 84. ☐ FT-1/T-1/T-3 Multiplexers/Services
☐ 85. ☐ DSL Services/Products
☐ 86. ☐ SONET
☐ 87. ☐ Inverse Multiplexers
☐ 88. ☐ SMDS
☐ 89. ☐ Diagnostic/Test Equipment
☐ 90. ☐ DSU/CSU
☐ 91. ☐ VSAT/Satellite
☐ 92. ☐ PBXs
☐ 93. ☐ Voice Mail/Response
☐ 94. ☐ Videoconferencing
☐ 95. ☐ Leased Lines
☐ 96. ☐ Switched Data
☐ 97. ☐ Virtual Networks
☐ 98. ☐ Outsourcing/Systems Integration Services
☐ 99. ☐ Education/Training Services

☐ 00. ☐ None of the above (1 - 99)

9 Please indicate the platforms that are currently installed/planned:

(check ALL that apply) **A. Currently installed** **B. Planned for purchase**

NETWORK PROTOCOLS

A B
☐ 01. ☐ TCP/IP
☐ 02. ☐ IPv6
☐ 03. ☐ SNA
☐ 04. ☐ DECnet
☐ 05. ☐ Novell IPX/SPX
☐ 06. ☐ APPC/APPN/LU 6.2
☐ 07. ☐ NETBIOS
☐ 08. ☐ AppleTalk
☐ 09. ☐ NFS
☐ 10. ☐ Other (please specify)____________

LAN ENVIRONMENT

A B
☐ 11. ☐ Gigabit Ethernet
☐ 12. ☐ Switched Ethernet
☐ 13. ☐ Fast Ethernet (100 Megabit Ethernet)
☐ 14. ☐ Ethernet
☐ 15. ☐ ATM
☐ 16. ☐ Token Ring/Token Ring Switching
☐ 17. ☐ IP Switching
☐ 18. ☐ FDDI
☐ 19. ☐ 100Base-T
☐ 20. ☐ 10Base-T
☐ 21. ☐ LocalTalk
☐ 22. ☐ Fibre Channel
☐ 23. ☐ 100vg Any LAN
☐ 24. ☐ Other (please specify)____________

NETWORK OPERATING SYSTEM

A B
☐ 25. ☐ Windows NT
☐ 26. ☐ Windows NT/Advanced Server
☐ 27. ☐ Novell IntranetWare
☐ 28. ☐ Novell (NetWare 4.X)
☐ 29. ☐ Novell (NetWare 2.X, 3.X)
☐ 30. ☐ Microsoft (LAN Manager)
☐ 31. ☐ LocalTalk (AppleTalk)
☐ 32. ☐ Banyan (VINES)
☐ 33. ☐ IBM (LAN Server)
☐ 34. ☐ Artisoft (LANtastic)
☐ 35. ☐ Other (please specify)____________

COMPUTER OPERATING SYSTEM

A B
☐ 36. ☐ NT Server
☐ 37. ☐ NT Workstation
☐ 38. ☐ Unix/Xenix/AIX
☐ 39. ☐ Solaris
☐ 40. ☐ Windows
☐ 41. ☐ Windows 95
☐ 42. ☐ Windows 97
☐ 43. ☐ DOS
☐ 44. ☐ OS/2/OS/2 Warp
☐ 45. ☐ IBM MVS/VM/VSE
☐ 46. ☐ Digital VMS
☐ 47. ☐ Macintosh
☐ 48. ☐ Other (please specify)____________

☐ 49. ☐ None of the above (1-48)

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NEWSPAPER

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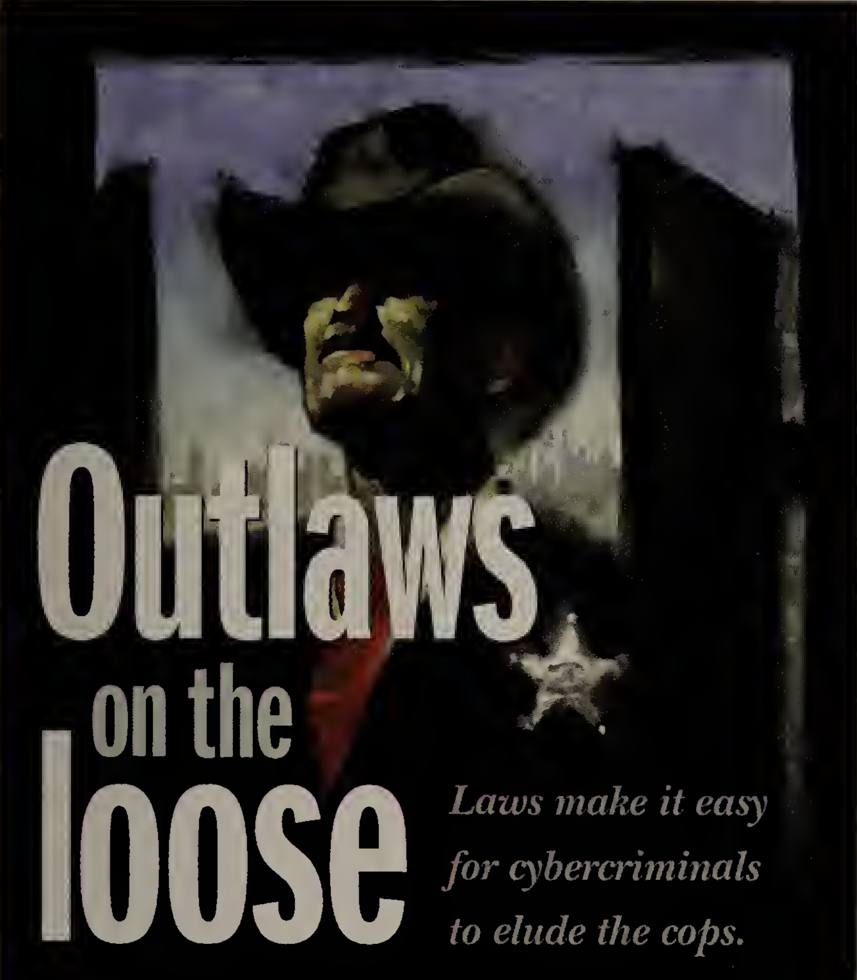
FEBRUARY 16, 1998 VOLUME 15, NUMBER 7

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

Zen AND NOW Novell goes to work on desktop management with ZENWorks. Page 8.



Outlaws on the loose

Laws make it easy for cybercriminals to elude the cops.

By Susan Breidenbach

Computer criminals are running rampant through cyberspace, picking corporate pockets from hideaways all over the planet. They operate on an electronic frontier that makes the Old Wild West look tame by comparison.

But there is no Matt Dillon or Wyatt Earp rounding up these outlaws. A legal system meant to deal with the physical world is having trouble coping with incorporeal crimes. There is little case law to fall back on and few statistics law enforcement agencies can use to make the case for bigger budgets to fight cybercriminals. On top of that, victims are reluctant to report security breaches, and the few criminals who do get caught often get the computer-related charges dropped when they plead guilty to other crimes.

See Outlaws, page 35

JOHN MARTIN/SIS

AT&T faces T-1 line shortage

Swamped switches forcing carrier to delay many T-1 access line installations.

By David Rohde

Users beware: The seams on AT&T's overtaxed network are ready to burst.

AT&T officials last week confirmed that high traffic demands have used up the capacity on some of the company's switches and transport routes, and the carrier is now delaying orders for T-1 access lines in many parts of the country.

The carrier has ordered account representatives to delay processing T-1 orders in designated "hot spots" until AT&T can provision enough new ports and circuits to carry the traffic.

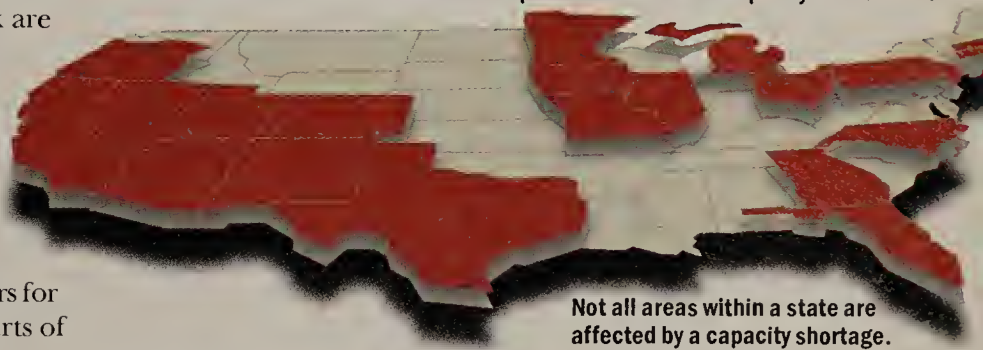
The shortages affect access to high-volume outbound and inbound voice services, as well as core data services that require a dedicated access line, such as private lines and frame relay.

The trouble spots are cropping

See AT&T, *page 56*

RED ZONES FOR THE NETWORK

States in which AT&T had declared "hot spots" of unavailable capacity as of Jan. 20.



Not all areas within a state are affected by a capacity shortage. Hot spots change weekly.

Microsoft to open directory door?

By Christine Burns
San Francisco

Vendors participating in the second meeting of the Directory Enabled Networks (DEN) initiative next week will be looking for Cisco Systems, Inc. and Microsoft Corp. to make good on promises to let other companies influence the direction of the emerging directory standard.

What vendors really want is an open specification review process, but most participants are skeptical about that happening with Microsoft and Cisco refereeing the game.

Microsoft and Cisco last fall spearheaded the DEN effort to rally support around efforts to represent physical network devices in operating system-based directories.

See DEN, *page 12*

Cisco's Gigabit end run

Industry watchers underwhelmed by Cisco's Gigabit Ethernet plan. Page 6.

More online
- **A copy of the DEN draft specification**
- **A DEN FAQ**

www.nwfusion.com 5841

Feds to breathe life into flagging EC effort

By Ellen Messmer
Washington, D.C.

The Clinton administration next month will try to revive the government's barely breathing electronic commerce strategy.

On the fifth anniversary of the National Performance Review (NPR) — the White House effort to push federal agencies into electronic commerce and improve how services are delivered to citizens — the government is likely to bet on Web-based forms, digital signatures and electronic catalogs as the underpinnings for its new plan.

The feds also are taking pains to listen carefully to state electronic commerce coordinators on issues such as digital signatures, because the federal government shares a large amount of funding and information with the 50 states. And electronic procurement cards (P-card) are expected to play a big role in online purchases.

Despite the best of intentions, the NPR, led by Vice President

See NPR, *page 57*

Al Gore's *electronic commerce initiative has largely failed.*

NEWSPAPER $5.00

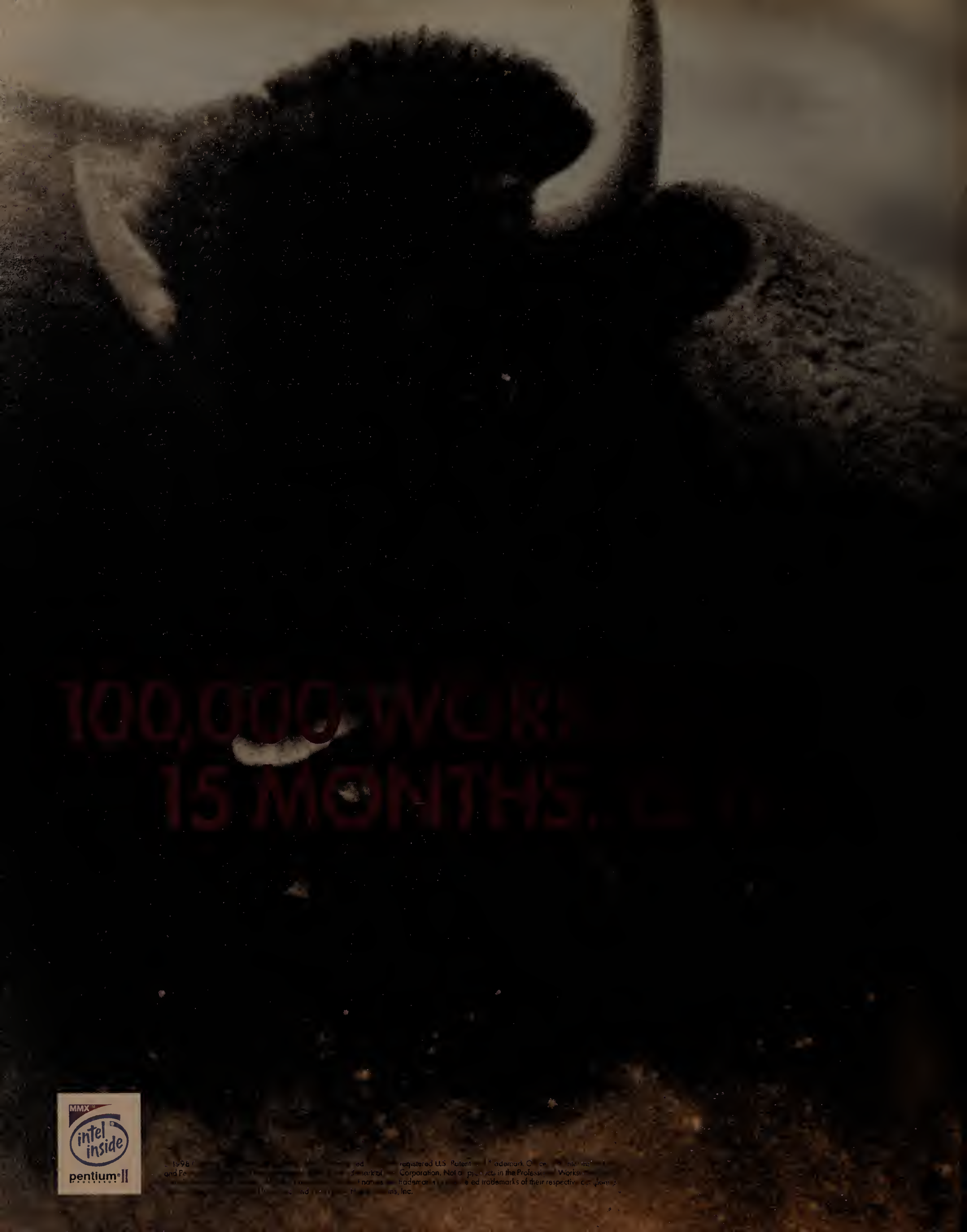
OS/2 die-hards feel Notes pain

By Paul McNamara
Cambridge, Mass.

A band of OS/2 die-hards is irate over Lotus Development Corp.'s decision not to offer a version of its Lotus Notes 5.0 client for the moribund IBM operating system.

The customers reported being "surprised," "angry" and "dumbstruck" by the move, with several going so far as to say the decision had undermined their faith in Lotus and its parent company, IBM.

See Notes, *page 57*



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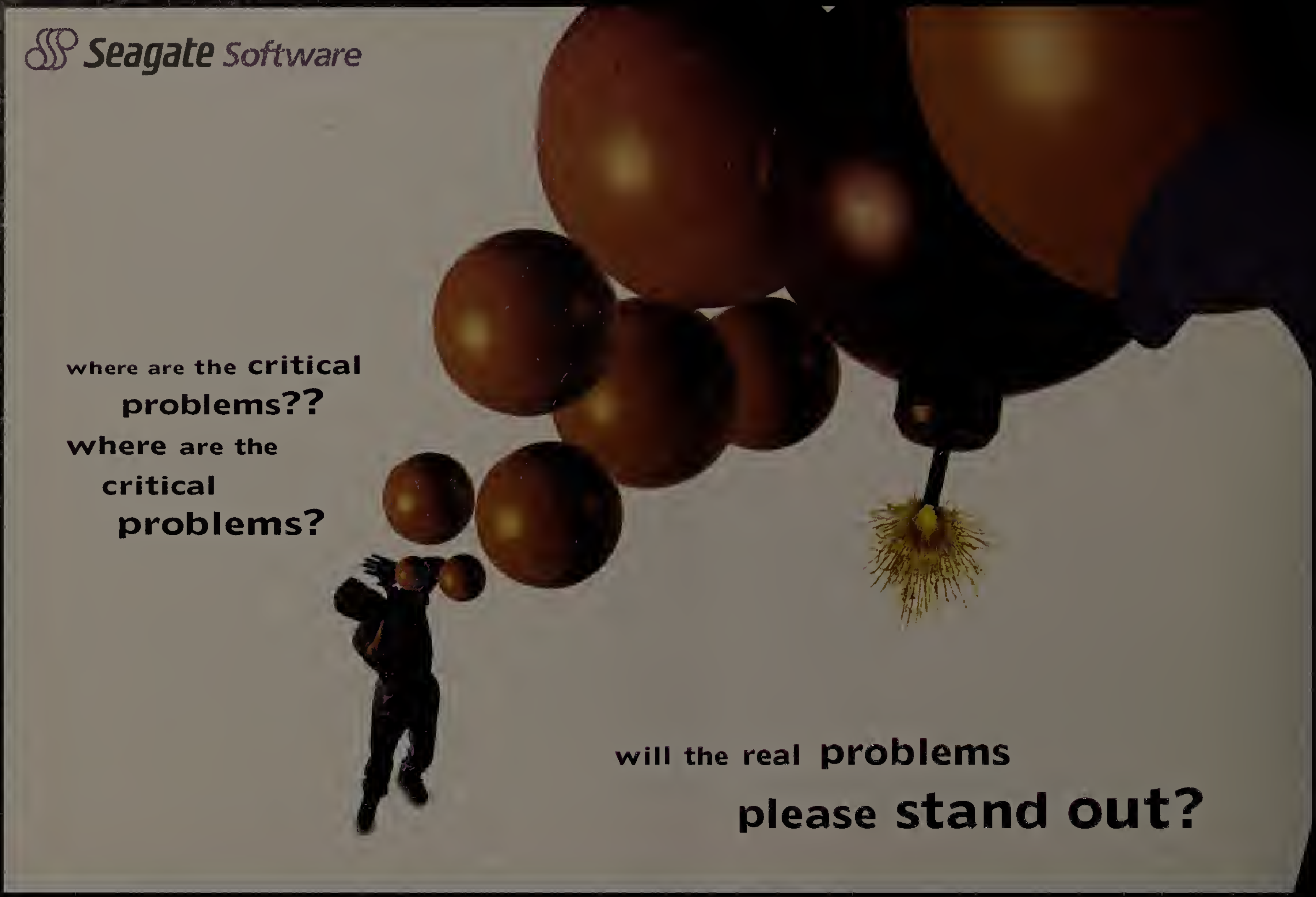
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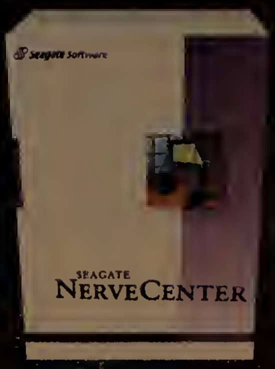

HARBINGER OF THINGS TO COME

Harbinger CEO David Leach sorts out what will stay and go in the wake of the Premenos acquisition. Page 10.

TOKEN RING LIVES

Olicom fires up a speedy new token-ring switch that costs about $275 per port. Page 15.

HP ON THE SPOT

The company will soon answer customers' service management questions, says HP executive Martin Haworth. Page 17.

STAN BAROU

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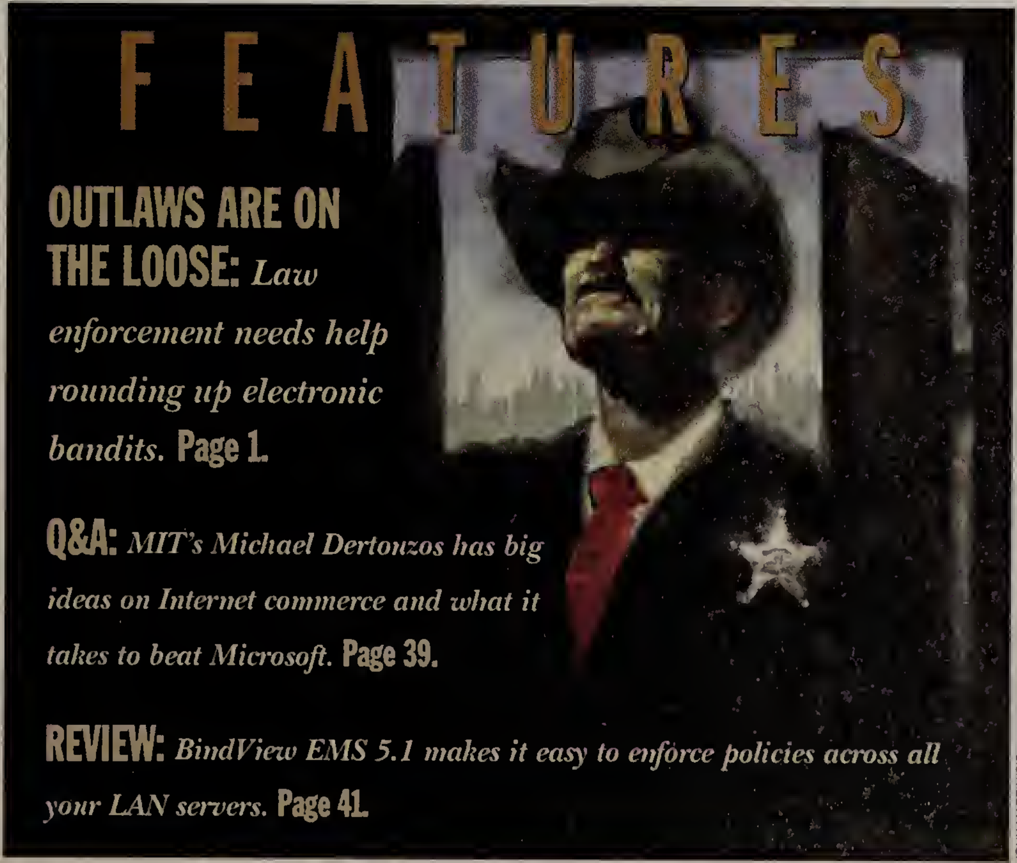
SPECIAL FOCUS

Access gear

The days of simple remote access are over. Page 20.

FEATURES



OUTLAWS ARE ON THE LOOSE: *Law enforcement needs help rounding up electronic bandits.* **Page 1.**

Q&A: *MIT's Michael Dertouzos has big ideas on Internet commerce and what it takes to beat Microsoft.* **Page 39.**

REVIEW: *BindView EMS 5.1 makes it easy to enforce policies across all your LAN servers.* **Page 41.**

JOHN MARTIN/SIS

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This Week

Only on Fusion

Internet access. Department managers at Osram Sylvania in Danvers, Mass., hounded their network systems division for years to get Web access. But once the 'Net floodgate was opened to all employees, those managers quickly asked for it to be closed. Read how this company and others are dealing with potentially objectionable material flowing across their IP gateways. **DocFinder: 5845**

Keeping Current. What's in a name? On the Internet, possibly a lot. Fred McClimans explains why, like it or not, you're probably going to have to add some money to the legal budget to protect your company's trademarks online. **DocFinder: 5846**

Site Watch. It's battle of the internetwork behemoths as Site Watch sees which has a better Web site: Cisco or 3Com. **DocFinder: 5525**

Front Page

Read our story on AT&T's struggle to keep up with demand for T-1 lines, then come online for articles on last year's T-3 shortage and on how telecom switch vendors are trying to meet the bandwidth crunch. **DocFinder: 5842**

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News briefs, February 16, 1998

Defining electronic commerce

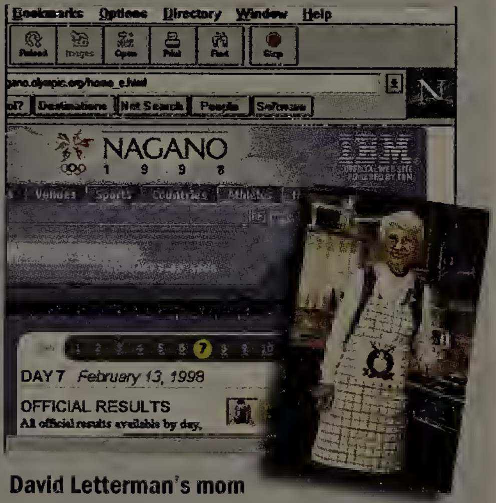
Top executives from global IT suppliers next week will meet to form a consortium that will define rules for conducting business-to-business electronic commerce. Currently known as the ECOM Standards Initiative, the group includes top managers from major computer manufacturers and distributors, software developers, resellers, banks and accounting firms, large IT users and systems integrators. Among the group's areas of focus are defining how IT products are categorized, which is important for Internet search engines and online catalogs, and how the supply chain handles common procedures such as product returns and accounting.

RBOCs hit long-distance wall (again)

U.S. District Court Judge Joe Kendall, of Wichita Falls, Texas, last week voluntarily stayed his New Year's Eve ruling that Congress and the FCC have no right to force conditions on regional Bell operating companies before they enter the long-distance market. Kendall's move gives the U.S. Court of Appeals in New Orleans time to review the decision without the threat that Bell Atlantic Corp., SBC Communications, Inc. or US WEST, Inc. — the three carriers that sued to overturn the long-distance conditions — could race into the long-distance market.

IBM's Nagano Olympic site wows Letterman's mom

In the first two days of the Olympic Winter Games, IBM's World Wide Web site weathered 42.7 million hits, while its e-mail service attracted Vice President Al Gore and the mother of late night talk show host David Letterman, IBM officials said last week. On the first day of the games, Feb. 7, the site received 19.6 million hits, surpassing the number of hits on the peak day of the 1996 Summer Games in Atlanta by 2.6 million hits. Traffic to the site surged to 23.1 million hits on Sunday.



David Letterman's mom *has admired the IBM Olympic Web site.*

Government blasts Internet subsidy plan

The U.S. government's General Accounting Office (GAO) last week blasted a hole in the Federal Communications Commission's E-rate program, a subsidy plan to provide Internet access at schools, libraries and rural hospitals. The GAO said the FCC had no legal authority to establish the Schools and Libraries Corp. and the Rural Health Care Corp. to run the program. Funding for E-rate administration comes largely from a controversial new FCC-ordered monthly charge of $2.75 on business phone lines.

Netscape targets extranets

Netscape Communications Corp. last week unveiled a new version of its SuiteSpot Professional Edition server with new directory and messaging capabilities. SuiteSpot 3.5 includes support for Lightweight Directory Access Protocol (LDAP) 3.0, Simple Mail Transfer Protocol and Post Office Protocol messaging, as well as filters for unsolicited bulk e-mail. The software also now supports Java Development Kit 1.1 and comes bundled with Netscape's Communicator client package. SuiteSpot 3.5 costs $140 per user.

Bay to use NEC for ATM backbone switches

Bay Networks, Inc. this week will announce a new line of ATM backbone switches sourced from NEC Corp., Inc. (*NW,* Feb. 9, page 37). The Centillion 1000 line features 16-, eight- and four-slot configurations and scales from 2.5G bit/sec to 10G bit/sec. The switches support OC-12, OC-3, DS-3/E-3 and DS-1/E-1 interfaces. They will ship in March at a starting price of $15,900.

Cisco's gigabit rollout fizzles

Servicing installed base and other legacy issues preclude high-speed innovations.

By Jim Duffy

San Jose, Calif.

After insisting it would not release product until the Gigabit Ethernet standard was set, Cisco Systems, Inc. last week went ahead and unveiled Gigabit Ethernet gear four months ahead of the standard.

But that is just one oddity in Cisco's gigabit network strategy that has some observers scratching their heads. Others include a piecemeal product rollout; Layer 3 switching derived from 3-year-old caching software that, by today's standards, is low-performance; and Gigabit Ethernet modules that appear to significantly oversubscribe the chassis on which they run.

ANALYSIS

Cisco has been waiting for the standard and the industry has been waiting for Cisco — but this is not what many were waiting for. "This is a pretty defensive move," said John Armstrong, principal analyst at Dataquest, Inc., here. "I would think that as the market leader in the networking [arena], they would also provide some market-leading technology, but this is not the case."

Cisco rolled out Gigabit Ethernet uplinks, modules and Layer 3 switching daughtercards for the Catalyst 5000 LAN switch line, and Gigabit Ethernet interfaces for the Cisco 7500 series routers (*NW,* Feb. 9, page 6). Three- and nine-port switching modules handle 6G bit/sec and 24G bit/sec of bandwidth, respectively, and a new Layer 3 switching daughtercard forwards two million packet/sec.

But Cisco's Gigabit Ethernet products have less to do with a gigabit network and more to do with protecting its installed base of Catalyst 5000 users. The new products enable Catalyst 5000 users to kick gigabit tires with server and interswitch links rather than to have to deploy a high-speed, systemwide gigabit network.

Indeed, if anything, last week's product rollout indicates that Cisco's technological innovation is handcuffed by its legacy systems and installed base.

"They have a problem; the problem is that any product they bring out has to be backward-compatible," said Michael Speyer, program manager at The Yankee Group, a consulting firm in Boston. "If they [don't] provide [backward compatibility] to customers, they risk losing them to less proprietary platforms."

Catalyst 5000 line: *At 3.6G bit/sec, can it handle the new Gigabit Ethernet modules?*

Still missing from Cisco's gigabit network roadmap:

- Higher speed Catalyst backplanes that support tens of gigabit/sec
- Layer 3 silicon distributed to Catalyst switch modules for scaling packet forwarding to tens of millions packet/sec
- A wire-speed, gigabit router for the campus

Cisco, the dominant supplier of routers, is the only leading network vendor without a product to show for the enterprise.

Cisco's Gigabit Ethernet products come as the Gigabit Ethernet standard, originally expected to be finalized next month, is being delayed until at least June (*NW,* Jan. 26, page 14). The lag in the standard is due to a differential mode delay (DMD) problem in running Gigabit Ethernet over multimode fiber.

See Cisco, *page 12*

Of Cisco, YAGO, Granite and Milan . . .

Rumors have it that Cisco Systems, Inc.'s Gigabit Ethernet travails included interest in acquiring YAGO Systems, Inc., a gigabit router company cofounded by two Cisco engineers and acquired four weeks ago by Cabletron Systems, Inc.

Were those rumors off base? Not according to some ex-Cisco engineers who noted a connection between Cisco, YAGO, Ethernet start-up Granite Systems, Inc. — which Cisco acquired 18 months ago — and Cisco's "Milan" gigabit multilayer switch project.

The ex-Cisco engineers, who requested anonymity, said the cofounders of YAGO — Romulus Pereira and Nilesh Shah — were developing Gigabit Ethernet multilayer switching products while employed by Cisco. Pereira and Shah joined Cisco when the company acquired Ethernet switch vendor Kalpana, Inc. in 1994.

When Cisco acquired Granite in September 1996, Cisco shuttered the project Pereira and Shah were working on and the two left Cisco to found YAGO that same month, according to the sources.

When Cisco found the Granite technology would not suffice for its Gigabit Ethernet multilayer switching plans, the company exhumed Pereira and Shah's project and code-named it Milan, the sources said. At YAGO, Pereira and Shah developed the MSR 8000 and MSR 16000 Multilayer Switch Routers and helped sell the company to Cabletron in 18 months.

As a result, Cabletron may beat the router leader to market with a gigabit wire-speed router by six months. Milan is expected in late summer or early fall. Cabletron's MSR is expected to ship in March.

After initially agreeing to talk with *Network World,* Shah later backed down.

"I don't know about the Milan project or anything like that," Shah said. "I really don't want to make any comments on that. I left a year and a half ago. I had an idea so I decided to get the other two founders together and we decided to form a company. There were no hard feelings, nothing like that. I'm not aware of what happened after I left."

Pereira did not return phone calls. Cisco declined comment.

— Jim Duffy

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Novell gets desktop management enlightenment

ZENWorks suite to include workstation management, software distribution and remote control capabilities.

By Christine Burns
Provo, Utah

Novell, Inc. this week will detail plans for a suite of directory-enabled applications aimed at simplifying the maintenance of networked Windows PCs.

ZENWorks — an acronym for Zero Effort NetWorks — comprises workstation management, software distribution, remote control and help desk integration tools. All of the ZENWorks tools can tap into Novell Directory Services (NDS), a distributed repository of information about users and networked desktop machines.

FINANCING WINDOWS PCs

The Gartner Group estimates the cost of owning a Windows 95 PC at almost $10,000 annually. Novell's ZENWorks attacks the areas of technical support, end user support and desktop administration that make up more than two-thirds of all Windows 95 PC upkeep costs.

The suite, which *Network World* first reported on last October, includes enhanced versions of Novell's Application Launcher, a software distribution tool, and Workstation Manager, a utility that helps network administrators control 32-bit Windows desktops. The suite also includes brand-new tools for remotely controlling PCs and providing hardware configuration data to help desk applications.

ZENWorks is designed to let companies manage thousands of desktops via NDS administrative consoles instead of having to physically touch each desktop to configure hardware and software, including applications.

The new product is mostly server-based, though customers also must have the latest Novell client installed on every desktop. While Novell plans to deliver ZENWorks as a stand-alone product in the second quarter, the suite eventually will replace the desktop management tool set that now ships with Novell's ManageWise offering.

ZENWorks is the first in a long list of products Novell plans to deliver that will show the true power of NDS.

"This product can make a directory service very valuable in a corporate environment," said Shilpa Agarwal, an analyst with Giga Information Group, in Cambridge, Mass.

Users participating in closed beta testing were generally pleased with the added control ZENWorks gave them over their 32-bit Windows machines.

IT professionals with the Plano School District in Texas want to use ZENWorks to support all teachers, administrators and students, who share a total of 15,000 desktop machines.

"We can now define certain users as 'teachers' in the NDS tree, which gives them access to a wider variety of applications than the students generally would have," said Judy Hays, a network engineer who is testing the software on two NetWare 4.X servers and several desktop machines.

Using ZENWorks, an administrator can define groups of users and grant anyone in a group access to a set of applications. When a user logs into any network desktop, ZENWorks pushes down the appropriate desktop configuration and any application software that the user has the right to access.

The U.S. Navy is beta testing ZENWorks as a possible way to upgrade software on its secure NT 4.0 workstation machines. The Navy currently locks down most of its NT machines so that end users cannot tamper with registry files, said Peter Cruikshank, an infrastructure engineer with the Space and Naval Warfare Systems Center, in San Diego. But this advanced security becomes an issue when new applications that must add files to the registry are installed.

"That meant sending someone with admin rights out to touch every workstation, which is not the best option when you are talking about thousands of machines," Cruikshank said.

ZENWorks allows Cruikshank to write simple scripts that are pushed down to secured desktop machines and appear to end users as icons. When a user clicks on one of these icons, the upgraded software is then downloaded to the desktop and installed there.

Novell will begin an open beta next month. Pricing has yet to be determined.

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Novell preps product potpourri

The directive from Novell, Inc. CEO Eric Schmidt since coming on board last April has been to get products out the door. With that in mind, Novell last week shipped a tool to help customers move to NetWare 4.X, and the company is poised to announce two additional product upgrades.

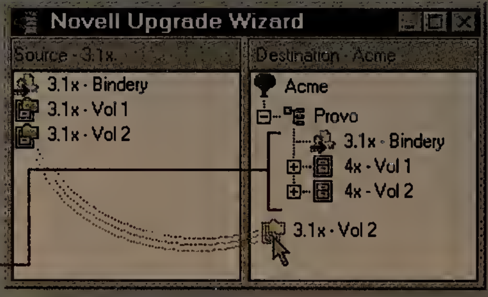
The new tool is called the Novell Upgrade Wizard and is now available for free via the World Wide Web. This graphical user interface-based program automates the process of migrating NetWare 3.X servers to NetWare 4.X. Specifically, this offering eases the pain of moving information from the NetWare 3.X bindery to the NetWare 4.X Novell Directory Services (NDS).

The wizard includes a drag-and-drop modeling feature that lets an administrator create an NDS tree structure offline before starting the upgrade process. This tool checks for conflicts and errors between the 3.X and 4.X servers, such as duplicate object names and disk space limitations.

Novell also this week will announce an upgraded version of its NetWare-to-IBM mainframe connectivity software, NetWare for SAA. This new version of the gateway is expected to provide tight integration with NDS and enhanced support for TCP/IP.

A little help from Novell

The Novell Upgrade Wizard walks NetWare 3.X users through the process of upgrading to NetWare 4.X and Novell Directory Services.



Tool lets users move to NetWare 4.X incrementally.

Finally, Novell Chief Scientist Drew Major last week said he expects to demonstrate software that provides load-balancing and fault-tolerance features for BorderManager at the company's Brainshare user conference next month. BorderManager is Novell's suite of Internet access management software.

Major said Novell's new software will allow companies to tie two BorderManager servers together at the edge of a corporate network, doubling the rate at which end users can access data from the Internet and allowing the servers to cover for each other if one goes down.

— Christine Burns

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What is the name of the effort led by IBM, Intel, HP and others to combine transactional and interpersonal messaging?

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Microsoft to ship Outlook 98

By Paul McNamara
Redmond, Wash.

Beta testers are giving generally high marks to Microsoft Corp.'s Outlook 98 e-mail/groupware client, which the software giant last week confirmed will begin shipping next month.

Microsoft promised Outlook users faster performance, simpler navigation and additional Internet standards support. Beta testers found Microsoft delivered on all features.

Outlook 98 will let users continue working while synchronization or downloading occurs in the background. It also will cut download time by selectively replicating only data that has changed and will automatically create a "contacts" entry for individuals to whom users send e-mail replies.

NEW IN OUTLOOK 98

- Background synchronization and downloading
- Selective field-level replication
- S/MIME, HTML Mail, vCard and fax support
- Today's Outlook view for managing mail, tasks and appointments
- Generation of "contacts" list entries based on incoming e-mail

The client also will support Secure Multi-purpose Internet Mail Extensions, HTML Mail and vCard, and it will come with a new "Today's Outlook" view that lets users see their most important e-mail, tasks and appointments at a single glance.

More than 250,000 users have acquired the beta code, Microsoft said.

The release will be important for Microsoft and its Exchange Server as the company continues to mount a charge against market leader Lotus Development Corp.'s Lotus Notes and Domino combination.

"The interface is very nice compared to Outlook 97, especially the Contact pane, which is better organized," said Patrick El-Azem, a systems developer at Conduit Communications, Inc., in Boston. "The client seems faster. Outlook 97 always had a very heavy feel to it."

The new consolidated view of the day's most pressing matters was well received by customers.

"Today's Outlook is a very nice feature, in that Outlook is able to manage so much information of so many types," El-Azem said.

Lotus will answer Today's Outlook with a similar feature in its Lotus Notes 5.0 client, due in the second half of this year.

Another Microsoft beta tester reported a possible bug in terms of Outlook 98's compatibility with rival Netscape Communications Corp.'s Netscape Mail.

"One problem I've had with Outlook 98 is that sending signed and/or encrypted, as well as rich, mail in HTML Mail using Internet standards is not compatible with Netscape Mail," said Rajiv Pant, head of technical development at Philadelphia Online. "I have verified this with at least five other users."

Scott Gode, an Outlook 98 product manager, said he was unaware of this difficulty, but, if verified, he could "guarantee ... it will be fixed before shipping."

El-Azem said he wished Outlook 98 had the ability to have multiple Exchange Server mailboxes, but he added that the absence of this feature is "not a big miss."

"For very large companies or users who travel among offices of a global corporation where Exchange Server replication is infrequent or nonexistent, it would be nice. Especially as Microsoft is positioning Exchange [for] enterprise-level connectivity and Outlook as the client of choice," El-Azem said.

Microsoft has not released price information for Outlook 98. n

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Harbinger outlines post-acquisition product plans

By Ellen Messmer

With the dust settling around its $210 million purchase of Premenos Technology Corp., Harbinger Corp. last week outlined how it plans to blend the two companies' product lines.

Harbinger, a longtime force in the electronic data interchange software and services market, completed its acquisition of Premenos in December. Harbinger was attracted to Premenos because of its Internet-based EDI and electronic commerce products.

While the companies appear to be a good match, there is product overlap — an issue addressed last week by Harbinger CEO David Leach.

Leach said Harbinger will keep its mainframe product, TrustedLink Enterprise for MVS/VSE but eventually will drop Premenos' similar EDI Open offering.

Harbinger also will keep pumping out its TrustedLink Enterprise software for Unix and Windows NT systems, Leach said.

However, Harbinger will phase out its version of TrustedLink Enterprise for conducting EDI on IBM AS/400 machines and will keep Premenos' EDI 400, which Leach said is the market leader with about 57% market share. "We'll provide tools from our OS/400 product for the migration so it won't be hard," he added.

CEO Leach *says Harbinger is now more than ready to provide services to corporations doing EDI on the Web.*

Large companies

For encrypted transmission of EDI forms over the Internet, Harbinger is jettisoning its TrustedLink Guardian product in favor of Premenos' Templar Secure, which is now being used by 80 large companies, including Chase Manhattan Bank.

While this number of companies may not seem large, it represents a significant foothold because these large corporations can have thousands of connected trading partners.

Harbinger will put development of TrustedLink Guardian on hold in March, Leach said.

Templar Secure, which uses proprietary technology for swapping encryption keys, will be enhanced to support the IETF IP Security standard, he said.

Templar Secure also will become an integral component of Harbinger's Internet Value-Added Services software, which is used to set up e-mail and EDI systems in large enterprises and telecommunications companies.

Despite its embrace of Premenos technology, Harbinger will not abandon all of its Web products. The company will continue developing Harbinger Express, a service that lets companies post Web-based EDI forms so trading partners can easily pick up purchase orders using a Web browser.

Harbinger also plans to keep selling its electronic procurement catalog, TrustedLink INP Web Content.

The electronic catalog is being used by book wholesaler Koch, Neff & Oetinger & Co. — the Amazon.com of Germany. ■

Microsoft mulls thin-client server pricing

Price will determine Windows-based Terminal Server's popularity.

By John Cox
Redmond, Wash.

Microsoft Corp. may be close to determining how much to charge for its long-awaited thin-client product, Windows-based Terminal (WBT) Server.

WBT Server, which will come bundled with Windows NT 4.0, is designed to give end users access to Windows applications from terminals running Microsoft's lightweight Windows CE operating system.

Microsoft calculates thin-client price

Users probably will have to wait until April to know the final prices for a Windows thin-client system. The price is expected to approximate that of Citrix's WinFrame server.

Windows-based Terminal: $350 to $950

Connection license estimate (modeled on current NT licensing): $100 to $200 per client

WBT Server: Price to be decided
(Compare to Citrix WinFrame today: $6,000 for 15 users)

Other costs:
Citrix Picasso option for ICA protocol access, load balancing and management: Price to be decided
(Compare to WinFrame Load-Balancing Option today: $1,495)

Several sources said they expect a pricing announcement in early April and a product roll-out in May.

High stakes

A lot is riding on Microsoft's pricing, which will determine how attractive WBTs will be as alternatives to traditional Windows PCs.

Several sources who have talked with Microsoft said they expect a pricing and licensing model similar to the one used today by Citrix Systems, Inc. for its WinFrame server. The Microsoft product is based on the Citrix model.

If Microsoft goes with that model, corporate users could pay around $6,000 for the multi-user software on Windows NT 4.0, and up to $200 for an access license for each desktop client.

Tektronix, Inc. last week took a risk by promising to resell the new Microsoft software for about $2,000 above the current WinFrame price. As part of its Windows terminal business, Tektronix today licenses WinFrame from Citrix and resells it, with some additional tools, under the WinDD label. Citrix lists WinFrame for 15 concurrent users at $5,995, the price Tektronix charges for WinDD.

Last week, Tektronix promised to sell the Microsoft software for $7,995 when it becomes available. For that price, customers will get Windows NT 4.0, the Microsoft WBT Server multiuser software and a set of Tektronix tools to let Unix desktop applications interoperate with Windows applications on WBT Server.

Also included will be Citrix's forthcoming Picasso option, which lets terminals and PCs connect to WBT Server using the Citrix Independent Computing Architecture protocol. Existing WinDD customers will be able to upgrade for $5,995.

These prices are for the server software. Customers, including current WinDD users, will have to pay separate fees for Microsoft client access licenses, and perhaps for per-seat Citrix licenses for Picasso, according to Tektronix. Exactly what the Microsoft licenses will cost has not yet been decided, and Citrix has not announced Picasso pricing.

Licensing issues

Microsoft is evaluating whether to modify the Citrix pricing model for WBT Server, according to John Frederiksen, Microsoft's group program manager for the thin-client offering. Citrix uses concurrent licensing with which customers buy the server software that can be used by anyone up to a set number of simultaneous users. Microsoft favors per-seat licensing.

Microsoft also is evaluating some kind of client-side charge that would be higher for terminals than for PCs, Frederiksen said. The rationale is that WBT Server adds more value to a terminal device — namely the ability to run Windows applications — than to a PC, which can run Windows applications locally.

Frederiksen emphasized that Microsoft is still in the pricing evaluation period. "Microsoft typically does not make pricing decisions until the final beta," he said.

The second beta release of WBT Server is due out by March 31. The final product is supposed to ship by June 1. ■

3Com delivers traffic mgmt. tools

By Robin Schreier Hohman
Santa Clara, Calif.

3Com Corp. this week will outline its plans for delivering policy-based management tools that will enable customers to prioritize traffic across enterprise networks.

The new offerings will let companies instruct their routers, switches and network interface cards (NIC) to treat classes of applications differently, giving certain classes priority over others.

This quarter and next, 3Com will introduce TranscendWare software for defining management policies on a switch-by-switch basis.

Policy-based management support will be available for 3Com's CoreBuilder 3500 and 9000 chassis-based switches, as well as its SuperStack II 1100, 9300 and 3900 stackable devices. The CoreBuilder switches can divvy up applications into four different traffic priority queues, while the SuperStack products can funnel traffic through two priority queues.

3Com also will enable customers to prioritize traffic across non-3Com switches and routers via support for the 802.1p and IP Type of Service standards.

In addition, the company will roll out software that lets NICs from 3Com and other vendors identify the priority of packets before forwarding them across a network.

In the third quarter, 3Com will release software for defining networkwide policies by application, individual, workgroup or department. Companies will use 3Com's new Transcend Policy Manager to set policies and the new Windows NT-based Transcend Policy Server to store and distribute those rules to network devices and desktop machines.

The products will support the Lightweight Directory Access Protocol for accessing the information needed to build policies.

By year-end, 3Com expects to make available software upgrades to some network devices that will allow Transcend Policy Manager customers to set priorities for traffic across mixed Ethernet and ATM networks.

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CA makes $9 billion bid for CSC

By Jim Duffy
Islandia, N.Y.

In a bold move to expand into the computer services market, Computer Associates International, Inc. (CA) last week made an unsolicited $9 billion cash bid to acquire Computer Sciences Corp. (CSC).

By acquiring CSC, CA would instantly become one of the top software developers and systems integrators in the industry. In addition to traditional rival IBM, CA also would join the ranks of Electronic Data Systems Corp. and the Big Six accounting firms, which includes Price Waterhouse, Ernst & Young and Andersen Consulting.

CSC is a key piece of CA's initiative to be a hardware-independent provider of enterprisewide software and services, said Charles Wang, CA's chairman and CEO. "[Five years from now] we want to be the leading provider of end-to-end solutions offering what we call platform neutrality," Wang said. "We'd like to be able to offer [everything] from management consulting, software development and systems integration to outsourcing."

Analysts say CA recognizes a golden opportunity. "They're responding to the unacknowledged but widespread truth that the implementation of distributed systems and network management solutions requires significant support services," said Richard Ptak, director of systems management research at D.H. Brown Associates, Inc., in Amherst, N.H.

CSC is a $6.3 billion provider of professional IT services, including management consulting, information systems consulting and integration, and operations support. The company is based in El Segundo, Calif., and has 44,000 employees and 600 offices worldwide.

CA has virtually no presence in the integration services market, and the company is not renowned for servicing and supporting its own products, analysts said.

"They really didn't have any sort of services to be able to bring to bear," said Steve Foote, an analyst at Hurwitz Group, Inc., in Newton, Mass. "IBM had armies of people to bring into any particular deal."

CSC management received CA's offer in a Feb. 10 letter from Sanjay Kumar, CA's president and chief operating officer. CA and CSC initiated discussions in December 1997.

CA is offering $108 for each CSC share, which is a 35% premium over the closing price of $80 on the day CA and CSC commenced discussions last December, Wang said. CSC stock was between $80 and $90 per share just before the offer, and closed above $104 last Thursday.

As of press time, CSC had not responded to CA's offer. In a prepared statement, CSC said it is evaluating the offer and will respond when it completes the evaluation. CSC urged shareholders to "refrain from taking any precipitous action concerning the proposal" until CSC management responds. ■

PROFILE: COMPUTER SCIENCES CORP.

Founded:	1959
Headquarters:	El Segundo, Calif.
CEO:	Van B. Honeycutt
1997 revenues:	$6.3 billion
Employees:	44,000
Business:	Management consulting, information systems consulting and integration, and operations support

Cisco

Continued from page 6

While Cisco's competitors and sundry start-ups were unveiling Gigabit Ethernet products throughout 1997, Cisco remained curiously inactive. Amid speculation that its $220 million purchase of Gigabit Ethernet start-up Granite Systems, Inc. in September 1996 was a bust, Cisco insisted it was waiting for the Gigabit Ethernet standard before unveiling products (*NW*, Sept. 26, 1997, page 6).

"My reading is that they're getting virtually nothing out of the Granite acquisition," said Dataquest's Armstrong. "They're contradicting earlier claims that they're going to wait and see (the standard)."

Cisco claims it is using the Granite technology in its new Gigabit Ethernet uplinks and switches. With regard to the standard, the company claims the DMD problem is a minor hiccup and that the standard is essentially stable.

In another apparent turnabout, Cisco is relying on its own Layer 3 switching technology — NetFlow — rather than leveraging Granite's. Cisco praised Granite's standards-based multilayer switching technology when it acquired the company 18 months ago (*NW*, Sept. 9, 1996, page 8).

NetFlow appears to present scalability issues. Cabletron Systems, Inc. and 3Com Corp., as well as innovative start-up companies, are placing Layer 3 silicon directly on line cards and forwarding tens of millions packet/sec.

Cisco plans to put NetFlow Application Specific Integrated Circuits on Catalyst line cards to scale up to 20 million packet/sec, said Soni Jiandani, director of marketing for Cisco's enterprise line of business.

Traversing the Catalyst 5000 backplane is yet another issue for Cisco's gigabit network scheme. The new Gigabit Ethernet modules can choke the 3.6G bit/sec Catalyst backplanes."

"That certainly is a valid question," said Michael Hashker, manager of network systems at the Medical University of South Carolina. "I was told by Cisco that replacement of the supervisor module would address that issue."

"You can think of [the Catalyst backplane] as a bottleneck, certainly," said Marthin DeBeer, product line manager for Cisco's high-end switching line. "But compare 17 million packet/sec on a single card vs. seven million packet/sec on an [Bay] Accelar [switch]. ■

DEN

Continued from page 1

The ultimate goal of this union is to give customers the ability to tailor network services — such as bandwidth allocation — on a per-user basis.

What is the DEN initiative?

The Directory Enabled Networks (DEN) initiative is an industrywide effort to define how vendors will integrate physical network devices such as hubs, switches and routers into software-based enterprise directory services. This combination is expected to allow customers to tie specific network services, such as bandwidth allocation, to individual users.

Microsoft and Cisco claim they are taking great pains to accommodate the interests of all participating vendors. But competitors charge that everything put on the table thus far is slanted in the duo's favor.

The first DEN meeting

At their first DEN meeting, in Redmond, Wash., last November, Cisco and Microsoft unveiled a draft specification that loosely outlined what device features or attributes could be stored in the directory. The specification also deemed that Lightweight Directory Access Protocol Version 3 would specify how network devices should input and extract information to and from any directory.

But competitors charged that clearly missing was a plan for how — if at all — Microsoft and Cisco would incorporate modifications and additions to the draft that might erase any competitive advantage for them.

"The process issue was raised in the first 30 seconds of that meeting and they didn't really have an answer," said Rod Anderson, director of the NetID product group at Bay Networks, Inc. NetID is Bay's IP address management initiative.

Bay, as well as FORE Systems, Inc. and 3Com Corp., said the Feb. 24 meeting in San Francisco will test how amenable Cisco and Microsoft are to change. All three vendors plan to submit plans on how the schemes can be altered to better suit a wider array of network gear.

Also, DEN participants claimed that Microsoft and Cisco have been very cagey about whether or not they will eventually turn the specification over to a traditional standards body.

"This meeting will test their intentions, good or bad," said Michael Simpson, director of marketing for Novell's directory and management products. "If we aren't convinced they are headed toward openness, the group stands to fall apart."

Kurt Dahm, a senior product manager in Cisco's directory division, said Cisco and Microsoft will make several announcements on this front next week. They will outline how participants can submit changes to the DEN specification and when the Internet Engineering Task Force and the Desktop Management Task Force will become involved in the process. Additionally, they will detail plans to hand off some control of the specification to a four-member user advisory board. ■

Novell vs. Microsoft on NDS for NT

The gloves are off again in the fight over whether or not Novell, Inc.'s NDS for NT renders the security of the Microsoft Corp. operating system moot.

Last month, Microsoft refused to support any NT customer with a technical security issue if that customer was also running Novell Directory Services (NDS) for NT (*NW*, Jan. 26, page 21). NDS for NT runs on an NT server and lets users manage Novell NetWare and NT user accounts and network access rights from the same directory interface.

Microsoft claimed that since NDS for NT taps directly into the NT Security Access Manager (SAM) database and redirects NT domain security information into NDS, it has irreparably altered the operating system.

On its Web site, Microsoft claims Novell could have bypassed this issue by using the Active Directory Service Interface (ADSI) to build NDS for NT. Microsoft said that while ADSI is geared for building applications using the unreleased NT 5.0 Active Directory Service, it does offer some hooks into existing NT 4.0 domain-based services.

Novell officials disagreed. "They wanted us to use ADSI because then we wouldn't have been able to ship a really valuable directory product for NT until they managed to get NT 5.0 out the door," said Michael Simpson, director of marketing for Novell's directory and management products.

— Christine Burns

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Local Networks

Covering: LAN Hubs, Switches and Management • Operating Systems • Servers • Thin Clients

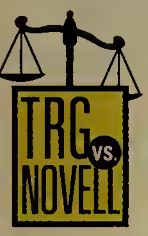
Briefs

Digital Equipment Corp. *last week revamped its* **Unix-to-Windows NT AllConnect migration program** *with the addition of several tools and service suites that target Web-enabled applications, application integration, and network and systems management.*

The AllConnect tools include Advanced Server 4.0 for Digital Unix, which gives Windows users access to Digital Unix-based file and print services. Advanced Server 4.0 for Digital Unix is available now and starts at $990 for 10 connections.

☎ *Digital: (800) 344-4825*

Timpanogas Research Group, Inc. (TRG), *the Windows NT fault-tolerant clustering software start-up formed last summer by three ex-Novell, Inc. employees, has been ordered by a Utah district court judge to stop developing commercial software for the next nine months.*



The ruling is a victory for Novell, which requested the injunction against TRG, charging that the former Novell employees had stolen trade secrets about Novell's yet-to-be released clustering technology. The ruling could give Novell as much as an 18-month advantage over TRG in delivering clustering products.

AG Group, Inc. *last week shipped a version of its* **EtherPeek for Windows protocol analyzer** *that includes new diagnostic tools. The new ProtoSpecs tool lets an administrator distinguish top-level protocols from subprotocols traveling over the wire. New plug-in modules let the software find and log duplicate IP address use and to log usage of File Transfer Protocol downloads. EtherPeek 3.0 is available now for $250.*

☎ *AG Group: (510) 937-7900*

Olicom gives token-ring switching a speed boost

New 8601 CrossFire Token Ring Desktop Switch boasts per-port price of $275.

By Robin Schreier Hohman
Plano, Texas

Olicom, Inc. is determined to breathe new life into token ring by giving customers a way to migrate to higher speed technologies cheaply, and without disrupting their installed base.

The company has announced its 8601 CrossFire Token Ring Desktop Switch, a desktop version of the Olicom 8600 backbone switch announced in October.

The new device is designed to give token-ring users inexpensive access to full-duplex, 32M bit/sec bandwidth and give them one less reason to move to Fast Ethernet. The 8601 acts as a feeder node to the 8600, which in turn supports links to ATM backbones, if required.

The 20-port 8601 costs $5,495, or $275 per port, and its more functional 20-port 8600 brother costs $7,980, or $399 per port. The per-port price for the 8601 is less than half that of other token-ring products, which typically start at about $600 per port, claimed Dan Jude, Olicom's switch manager.

The 8601 CrossFire Token Ring Desktop Switch's *per-port pricing is less than half that of other token-ring products.*

The 8600 and the new 8601 offer three different switch modes: cut-through, store and forward, and adaptive. They also support Remote Monitoring, Spanning Tree, virtual LAN and SNMP technology.

Despite token-ring tech-nology and price improvements, the barrage of higher speed alternatives has forced network managers to face facts: Token ring is not, and may never be, faster than Fast Ethernet, ATM or Gigabit Ethernet. Worse, most token-ring vendors do not even seem interested in supporting the technology anymore: instead, they are trying to entice customers to migrate to Fast Ethernet.

3Com Corp., which still manufactures token-ring products, is not so subtly trying to get token-ring customers to migrate to Fast Ethernet. The company's position paper on its new Token Ring-in-Fast Ethernet (TR-in-FE) product states: "The primary technical objective of the TR-in-FE solution is to provide our customers with a more cost-effective method for token-ring networks to be integrated with Fast Ethernet networks, and to promote seamless communication and the sharing of resources, all while still maintaining wire-speed performance."

And even though 3Com is one of the founding members of the High-Speed Token Ring Alliance, which is seeking to create a 100M bit/sec token-ring standard, the company is not completely sold on it. John McIlwaine, token-ring product manager at 3Com, said high-speed token ring would have stood a much better chance of succeeding if it had been created a couple of years ago.

Olicom is not oblivious to Ethernet's market domination over token ring, but the company contends there still are plenty of customers that do not need the speed of Fast Ethernet. Olicom has shipped nearly 23,000 8600 ports since rolling out the product last fall, proving there is demand, Jude said. He is optimistic that the 8601, which starts shipping in March, also will meet a need.

Al Foitag, director of technical support at a large entertainment firm, swears by Olicom, but he said increasing bandwidth demands are pushing him toward Ethernet and ATM. He is using about a half-dozen 8600 switches with 300 to 400 end users on each switch at the company's Burbank, Calif., studios.

☎ Olicom: (972) 423-7560

Get more online: FIND IT ON FUSION 5823

- **A white paper on token-ring migration from Olicom**
- **Papers on trying to bring token ring up to 100M bit/sec and even gigabit speeds**

www.nwfusion.com

Samsung enters LAN market with low-cost hubs and switches

By John Dix

Few companies would dare venture anew into the highly competitive hub/switch market at this stage of the game, but few companies have the resources of Samsung Group, the 14th largest company in the world.

The company's Samsung Telecommunications America arm last week unveiled its Networks division, which hopes to make its mark in the LAN business by offering a family of low-cost stackable hubs and switches that support 10M/100M bit/sec speeds on all ports.

The idea is to hit this market sweet spot with simple, reliable, low-cost products and then build from there, said Mark Stubbe, vice president of the division.

While competitors are screaming about Gigabit Ethernet and switched this and switched that, Stubbe argued there is a contingent of users who will welcome Samsung's Smart-Ether hubs, which deliver 100M bit/sec of shared bandwidth to the desktop for less than $50 per port. Samsung offers stackables with four, eight, 16 or 24 ports.

That may be so, agrees Esmeralda Silva, a senior analyst with research house International Data Corp., but shipments in the 10M/100M hub market started to decline in the third and fourth quarters last year as prices for 10M/100M switches began to drop. Switches deliver a full 100M bit/sec to the desktop while hubs share that bandwith among attached devices.

Samsung will address the 10M/100M switch market with eight- and 16-port configurations that list for $130 per port. "That's very competitive," Silva said, adding that she expects per-port pricing for this market segment to drop some 30% this year.

The SmartEther 16-port switch supports the Spanning Tree Protocol, port-based virtual LANs and Remote Monitoring. It is SNMP manageable with Samsung's SmartView software, which is included in the $2,199 list price for the box. The eight-port switch lists for $1,139 and is not managed.

On the hub side of the line, the basic products are not managed, but a 24-port managed box — the SmartEther SH2224S — can be used as a foundation to build a managed stack of up to 120 10M/100M bit/sec ports.

Asked how Samsung expected to break into a market dominated by the likes of Cisco Systems, Inc., 3Com Corp. and Bay Networks, Inc., Stubbe said pricing and functionality would give Samsung a toehold.

The worldwide Ethernet market, he pointed out, is some $10 billion per year. So even a small piece of it could be a substantial business.

Silva also points to the Samsung resources Stubbe has to call on: world-class manufacturing and semiconductor expertise.

☎ Samsung: (972) 761-7200

WIRED WINDOWS

Changing the game plan

I may have mentioned once or twice already that throughout this year I'll be writing about planning. Last week, I suggested building a rolling three-year plan so you can be sure of the direction you are heading in and make the choices necessary to get there.

This week, though, the topic is a little more immediate.

I was at a hockey game the other night between home team Austin Ice Bats — scourge of the Western Professional Hockey League — and the Monroe (La.) Moccasins — a team in next to last place.

As often happens in minor league hockey, an altercation broke out in front of the Austin bench. The sticks came out, and one struck the Austin coach in the head. The coach was taken away with five minutes left in the second period and with Monroe just one goal ahead.

Without the coach, Austin lost by three goals. Now, the coach may have had a comeback plan ready for the third period, but he never got to talk to the players between periods and evidently had not briefed his assistant coaches about it.

What would happen if you were incapacitated for a day, a week or a month? Like a good coach, you probably already make sure that everyone knows your game plan before getting started on a project. But how frequently do you update your staff about changes? Do you have a way to let your folks know about changes as they occur? You should.

You could accomplish this with something formal, such as project management software to track progress. Or you could use a Lotus Notes, GroupWise or Exchange forum or e-mail list to share the information.

Dave Kearns

Whatever your plan is, it should be more formal than meeting around the coffee machine, and it should be used as often as necessary so that everyone has the information they need when they need it. That way, even if you're unavailable, the project doesn't come to a grinding halt.

Besides projects, there's the everyday workings of your department. If you are unavailable for a week or more, can your team make an informed decision? More important, will they make a decision you can support?

They will if you've provided them with the correct information. This doesn't mean constantly memoing them with every thought you have. It does mean having periodic conversations to learn about their current activities and to pass along information about yours. A well-organized filing system, a good scheduler (up-to-date, of course) and a current, easily accessible contacts list should most definitely also be in place.

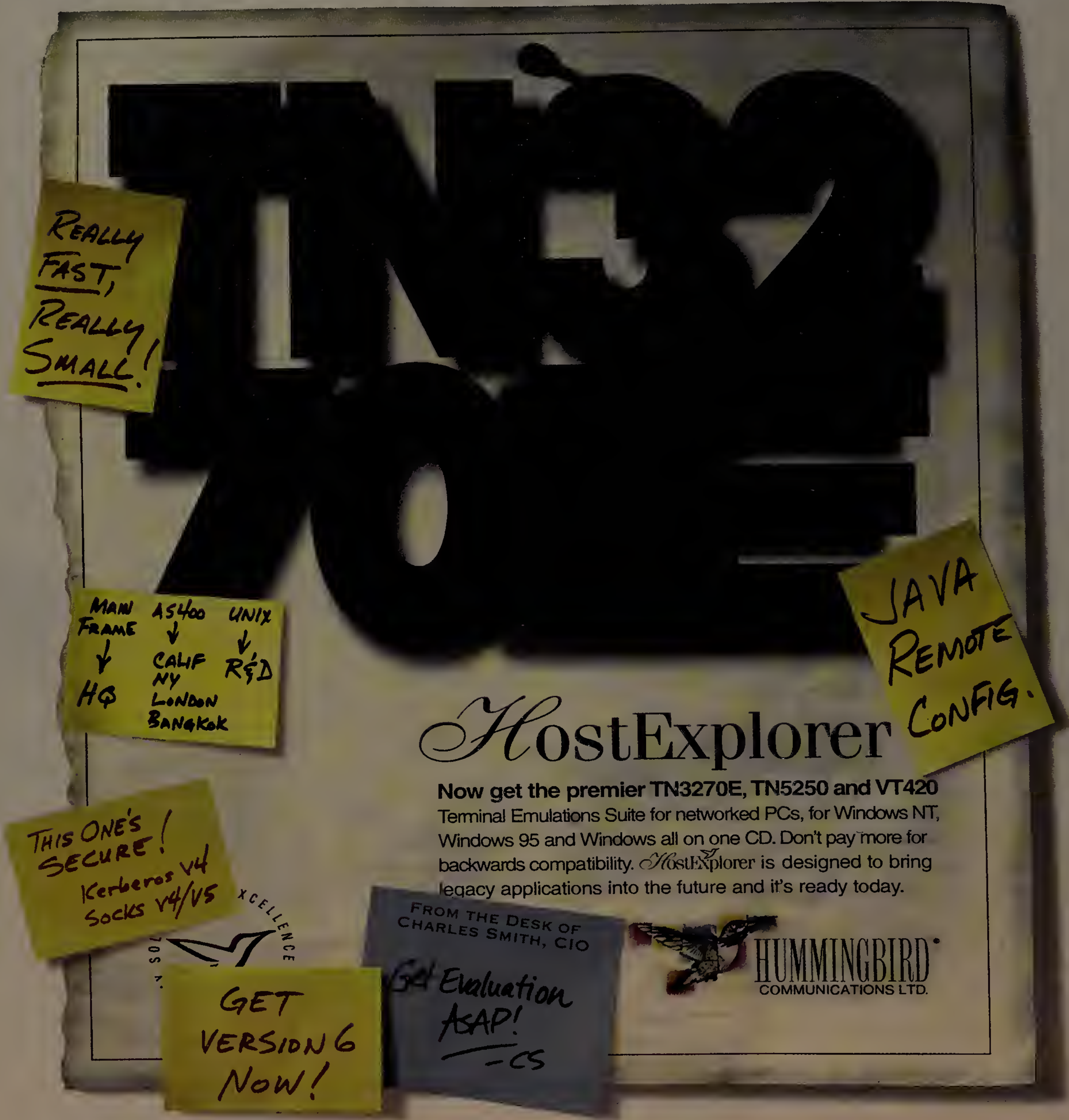
If you're organized and if you plan, then you can be fairly sure your team won't fall apart in the third period just because you're not there.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

Tip of the week

If you are involved with electronic commerce, take a look at the Electronic Commerce and Rights Management list. In it, industry participants discuss the future of EC. Subscribe by sending e-mail to Majordomo@lists.kcinc.net. In your message put subscribe e-carm.

To an IT manager, this is a pin-up.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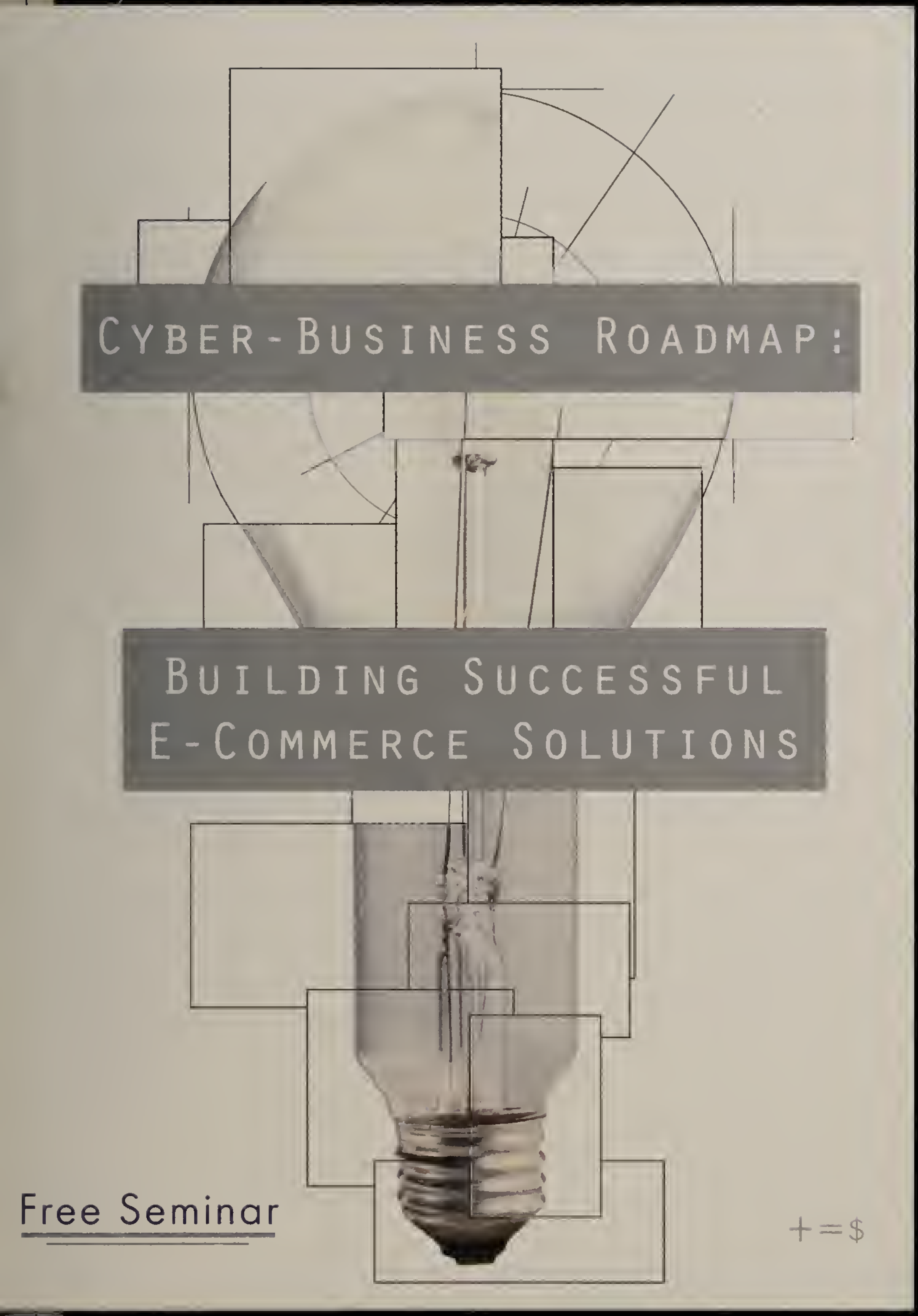

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Briefs

■ **Seagate Software, Inc.** *last week unveiled a new version of its* **NerveCenter event correlation** *software that features tighter integration of Window NT and Unix event management.*

NerveCenter 3.0 features a unified NT/Unix console and a centralized aggregate alarm console for downstream poll suppression. It also integrates with Seagate's Crystal Reports software for performance trend and analysis reporting. It also features simplified behavior model creation as well as an alarm counter to handle repeated events.

NerveCenter 3.0 costs $2,195 for a single server managing 10 nodes and $24,995 for a single server managing unlimited nodes. It is available now.

✆ Seagate: (800) 327-2232

■ **DeskTalk Systems, Inc.** *has rolled out a new version of its* **Trendweb reporting software** *that lets users create and view performance reports from a Web interface.*

Trendweb 3.0 lets users create multichart reports and then distribute those reports to other users' browser screens.

Trendweb 3.0 costs $7,500 and is available now.

✆ DeskTalk: (310) 323-5998

■ **IBM** *last week strengthened its Seascape Storage Enterprise Architecture with the announcement of a new server to* **speed Internet access.** *The IBM Web Cache Manager is an Internet storage server designed to reduce long-distance transmission costs.*

Cache Manager uses disk and high-speed tape to store local copies of popular home pages and pictures for users to access. This avoids having to transmit the data over the Internet each time the pages are opened.

IBM also announced InfoSpeed, a software package that enables data transfer between Unix and Windows NT servers and any S/390 mainframe disk or tape storage subsystem. Pricing for both products was not disclosed.

✆ IBM: (914) 765-1900

HP's service management silence is deafening

Nine months after Prolin acquisition, company has yet to show OpenView advantages.

By Jim Duffy
Fort Collins, Colo.

Nine months after acquiring service management vendor Prolin, Hewlett-Packard Co.'s OpenView division has yet to show any benefit from the transaction.

The absence of Prolin-enhanced OpenView products is underscored by speculation among HP third-party developers, integrators and other observers that HP does not know what to do with Prolin's technology. But HP claims it is currently shipping Prolin-based service management tools, and many believe HP will demonstrate the jewels of the acquisition in a couple of weeks.

Prolin, located in Amsterdam, is a developer of help desk, change and configuration management software and reporting and accounting software.

The company's flagship product, Prolin IT Service Manager (ITSM), consists of a suite of eight integrated software modules that help businesses manage IT infrastructure and the services that support business operations.

Get more online:

- A broadcast of our recent Network and Systems Management Showdown
- An archive of recent announcements by major management vendors

FIND IT ON 5824 FUSION

HP acquired Prolin to bolster its fledgling IT service management initiative (*NW,* March 31, 1997, page 8). But to date, all is quiet on the Prolin front.

Unclear position

"I think it's pretty obvious they didn't know exactly where to position [ITSM]," said Paul Edmunds, senior network analyst at Duke Power Co., in Charlotte, N.C., and president of the OpenView Forum user group.

Duke has no plans to use Prolin technology, having just closed a deal with help desk vendor and OpenView third-party developer Remedy Corp., Edmunds said.

"There's a lot of integration work going on right now. We'll have a road-map for future enhancements... around problem management."

Martin Haworth, manager of solutions and support services, Hewlett-Packard

STAN BAROUH

But he said he expects HP to make a splash with Prolin and ITSM at the OpenView Universe conference March 3 in Boston.

"I'm actually waiting for their major announcement at HP Universe," said Vishal Desai, president of Savli Group, Inc., in Silver Spring, Md. "That's where they're looking to roll out a much more comprehensive strategy, [with] integration points between PerfView and Prolin and some of the other applications."

PerfView is HP's performance measurement application.

HP currently is shipping a version of its IT/Operations systems management software with ITSM enhancements, "such as the ability to configure service-level objectives... so they will monitor and report response time violations," said Martin Haworth, manager of solutions and support services for the OpenView division.

No progress

Third parties, though, said they are unaware of progress since the Prolin acquisition.

"It was a good move. It was very timely, and they selected a good product," said Saverio Merlo, vice president of marketing at Boole & Babbage, Inc., an HP OpenView Premier partner that also is focused on the service management market.

"How well they've integrated the product since, I really don't know," he said.

"It certainly filled a gap. Previously, they were relying solely on partners," said Rick Sturm, principal at Enterprise Management Professional Services, Inc., a Boulder, Colo., network management consultancy. "I haven't seen [ITSM] ... giving them any material advantage" in service management, he said. ■

Cisco to use Persistence to gain 'Net boost

Router giant will use new software to reduce WAN costs.

By Marc Ferranti

Cisco Systems, Inc. last week announced that it has made an unspecified equity investment in Persistence Software, Inc., saying it was attracted by new Persistence application server caching software designed to boost network performance.

Persistence's upcoming PowerTier application server will become a key component of Cisco products designed to enhance network performance, Cisco said in a statement.

The Persistence PowerTier software, to be released next month, is based on Persistence's live object caching software, which resides on application servers between front-end interfaces and back-end relational databases, caching the most commonly used data for fast access, according to the company.

In addition to accelerating the performance of the back-end database, the caching capabilities of PowerTier are designed to reduce network traffic between the application server and the relational database, according to the companies.

PowerTier also is designed to perform multiple simultaneous tasks in a single user session. It also provides ProActive agents, which alert users when critical data is updated.

PowerTier works with the Common Object Request Broker Architecture, the Unified Modeling Language, Java, Visual Basic and C. It runs on machines based on Unix and Windows NT operating systems.

Internet builder

Cisco currently offers a Web caching engine designed to help scale the Internet. The Cisco Cache Engine is a carrier-class, dedicated Internet appliance designed to eliminate repeated transmission of redundant Web content.

The Cisco Cache Engine stores Web pages locally, enabling Internet service providers and private enterprise network users to reduce WAN usage costs by decreasing the number of times traffic is sent over wide-area links.

PowerTier will be released in March, with development licenses starting at $8,000 per developer and deployment licenses starting at $10,000 per server.

For more information, call Cisco at (408) 526-4000 or Persistence at (650) 372-3600.

Ferranti is a correspondent with IDG News Service's New York bureau.

Tavve software helps manage IP net performance

By Marc Songini
Durham, N.C.

The less human intervention in network management, the better.

That is the idea behind three new software packages from Tavve Software Co. that promise to ease the performance and problem management of large IP-based nets.

The three products, tsc/Fault Management, tsc/Web and tsc/QuickView, run on Hewlett-Packard Co.'s OpenView or IBM subsidiary Tivoli Systems, Inc.'s TME 10 enterprise management packages. All three products make use of the data that resides in OpenView or TME 10's central database in order to work.

For example, the tsc/Fault Management application gathers network topology information from the OpenView or TME 10 database, polls network devices to obtain an up-to-date status report and uses that information to correlate events and pinpoint problems.

Events or problems discovered by tsc/Fault Management can be viewed on the central TME 10 or OpenView monitor. Automation scripts can be written to page net administrators when problems arise.

The tsc/Web package uses the central TME 10 or OpenView database to monitor IP device configuration and performance. Real-time reports can be generated and gathered by remote administrators using any Web browser software. The idea behind tsc/Web is to allow net administrators to check the health of any remote net sites without having to send knowledgeable staff into the field every time there is a problem.

Finally, the tsc/QuickView application lets users build a customized subset menu of services available from the host OpenView or TME 10 platform.

For example, if a user has a device-level manager from Cabletron Systems, Inc. and a sniffer package from Network General Corp., users can program tsc/QuickView to bring information generated by those applications quickly on to the OpenView or TME 10 screen.

Without this feature, users would have to hunt through multiple screens and maps to get at this information, said Anthony Edwards, president of Tavve.

The principle behind the Tavve software is to eliminate much of the manual labor required to run a large network and automate the work instead, said Nick Francis, president of the Madison Group consultancy in Cary, N.C. "You don't need a staff of people who understand all the nuances of network management to understand this. The program itself goes out and collects the information and lets you quickly make use of it," he said.

Pricing for the Tavve software will run from $15,000 to more than $75,000, depending on configuration.

© Tavve: (910) 674-7189

PROFILE: TAVVE SOFTWARE CO.

Founded:	1996
Headquarters:	Durham, N.C.
President:	Anthony Edwards
Financials:	Privately owned; Seeking $2 million in venture capital
Employees:	Six
Principal products:	Network monitoring and performance tools

1998 Seminar Dates and Locations:
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April 14 Philadelphia, PA
April 29 Boston, MA
April 30 New York, NY
May 20 Los Angeles, CA
May 21 San Francisco, CA
June 2 Atlanta, GA
June 3 Dallas, TX

PRESENTER
Anura Gurugé

NetworkWorld
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INTEGRATING INTRANETS & DATA CENTERS
SNA-CAPABLE INTRANETS

Seminar Overview:

Intranets have become synonymous with next generation enterprise networks and the Internet itself is becoming a gigantic, virtual storefront for global commerce. However, with all of their vast potential, Internet and intranet-based information systems have a fundamental flaw. They do not intrinsically support the mega repositories of data located on non-TCP/IP-based systems — in particular the IBM and compatible mainframes and large AS/400 systems that still dominate the business-critical data centers of over 20,000 mid- to large-scale U.S. commercial enterprises.

In such enterprises, over 70% of the vital corporate data resides within the traditional data center as opposed to on the web servers hosting their nascent intranets. The data center systems, though increasingly supporting and integrating TCP/IP, will be running mission-critical SNA applications well past the year 2000. Enterprises that currently have data centers have no choice but to somehow integrate their new intranets and Internet interfaces with the SNA-centric systems, applications, files and databases that reside within the data center.

Taught by SNA-Internet integration expert Anura Gurugé, *Integrating Intranets and Data Centers* will help network managers, planners/designers, data center managers, systems programmers and database managers navigate the intricate issues surrounding the integration of data centers with intranets and the Internet.

If your organization has mainframes or AS/400s and are in process of implementing or have already implemented an intranet or an Internet gateway to your information repositories — this seminar is for you. *Integrating Intranets and Data Centers* will provide you with incisive, credible and comprehensive information so you can identify, evaluate and implement intranet-to-data center integration solutions in your organization.

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2. Gain key insights on utilizing Java and JavaBeans technology for data center integration.
3. Explore various options for rejuvenating the dated 3270 user interfaces of SNA/APPN mission-critical applications without having to modify the mainframe or AS/400 resident applications.
4. Understand the network management implications of an Internet technology-based network that sustains mission-critical SNA/APPN applications.
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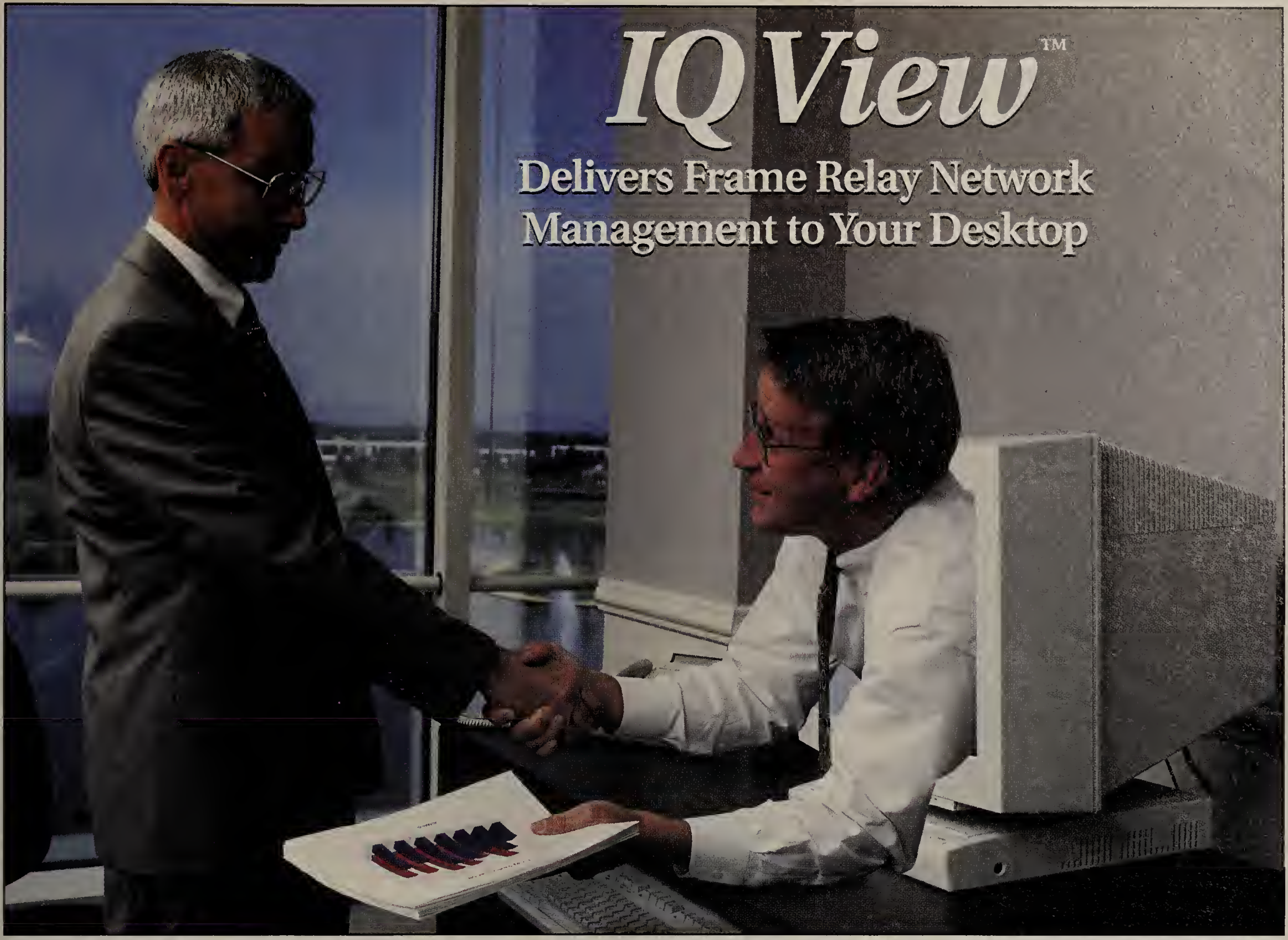
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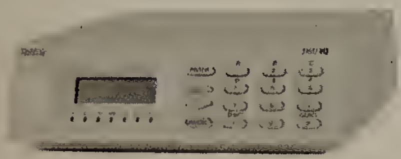

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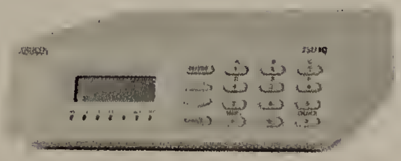

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SPECIAL FOCUS

Access gear

Wanted: Refined remote access

By Tim Greene

Once upon a time, supporting remote access was as simple as buying a bunch of modems and a terminal server. But those fairy-tale days are gone.

Network managers now need to consider firewalling, authentication, encryption, compression, assigning limited access rights for extranets and managing an ever-growing number of remote clients.

Fortunately, remote access boxes are becoming more sophisticated and are able to efficiently handle the growing list of requirements.

Net managers need to constantly monitor the demand of their users and plot a course that will allow them to keep up without overloading their staffs and budgets.

For example, Wright State University is looking to get rid of rack-mounted modem banks and shift over to a remote access concentrator, says Larry Fox, network manager for the Dayton, Ohio-based college. He still is deciding whose to buy.

His service provider, Ameritech Corp., will aggregate all the calls from dial-in users onto a single Primary Rate Interface ISDN trunk. While other areas of the country have had PRI available for years, it is just now becoming a service option in Dayton.

PRI availability gives Fox the chance to clean up the wiring closet by replacing racks and racks of gear with a single remote access concentrator box.

The transition to PRI also will eliminate scores of individual phone lines, supply a digital connection that supports 56K bit/sec modem technology and ISDN, and potentially offer more sophisticated security and management options, Fox says.

It's a modular world

Fox wants management features that enable the remote configuration of ports. And he wants the concentrator to support encryption as well as Remote Authentication Dial-In User Service (RADIUS)-based security services.

The concentrators he is considering are modular and can take in T-1 or PRI trunks to handle modem or ISDN calls. They can be hardware upgraded with new cards supporting new features.

The modularity is important because it protects customer investment and also allows the concentrators to be customized for specific user needs.

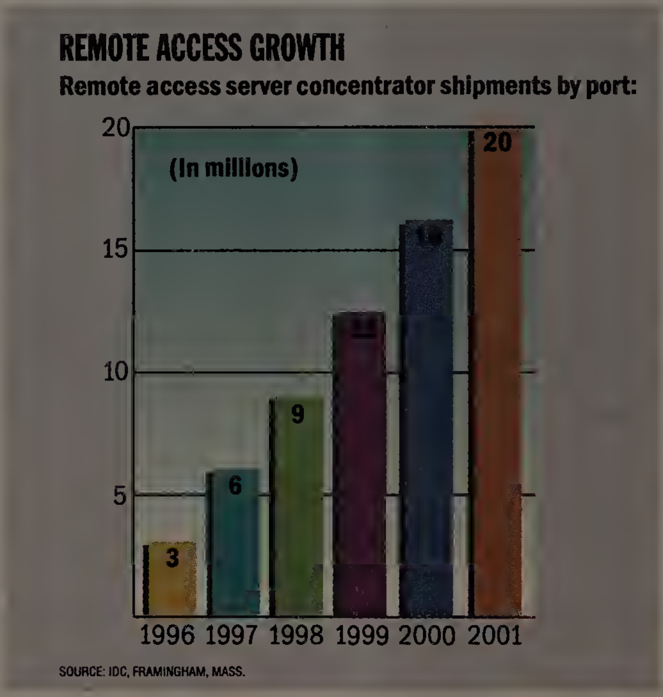
While the field is crowded, 3Com Corp.'s Total Control remote access concentrator exhibits many of the features common to the concentrator field.

A single 3Com chassis has the following components: a DSU/CSU; a PRI termination device; analog and digital modems; a terminal server; and a router that supports IP, IPX and frame relay.

Because the chassis is modular, 3Com last year was able to increase the processing power of the unit by introducing new digital signal processing cards. With the additional processing power, 3Com then introduced a card that translates voice traffic to IP and vice versa.

Similarly, Total Control supports a server card that can store frequently accessed data, thereby reducing the amount of remote traffic that hits the corporate LAN. The server runs on Microsoft Corp.'s Windows NT platform.

Other products with a similar modular design include Ascend Communications, Inc.'s MAX 4000, Bay Networks, Inc.'s Adapteon 8000 Access Switch and Cisco Systems, Inc.'s AS5300.


REMOTE ACCESS GROWTH

Remote access server concentrator shipments by port:

SOURCE: IDC, FRAMINGHAM, MASS.

Keeping data safe

While the concentrators take care of traditional modem-termination functions, their role is expanding to include other areas.

Security is one area that is key to Ken Green, network analyst for Landis & Gyr Utilities Services, Inc., in San Jose, Calif. In stepping up from modems and a terminal server to Shiva Corp.'s LanRover XP 16 remote access server, he gained security options.

Green welcomed the transition from a user name and password authentication to a RADIUS server.

RADIUS servers store authentication data that the terminal server checks before allowing remote user access. It also can house data about what network resources the remote user is allowed to access and what resources are off-limits.

Not only is Green's network more secure, the RADIUS server streamlines authentication. Before using concentrators he had to set up passwords user by user.

Now by linking the concentrator to Novell, Inc.'s Novell Directory Services used in the corporate LAN, an entire class of users can be granted privileges as a unit.

"You can set up dial-in or dial-out groups from one point. It's less work for me," Green says.

Most of the platforms also support Password Authentication Protocol, Challenge Handshake Authentication Protocol and Terminal Access Controller Access Control System (TACACS) authentication procedures and token password technologies.

The VPNs are coming

Many remote access concentrators that are well-suited to corporate networks, such as Ascend's MAX, can also be used by Internet service providers. Traditional telephone carriers are recognizing that remote access devices could be used in their networks to offer remote access services. The carriers handle the modems and customers get a broadband packet feed from the carrier.

At the same time, corporate users are recognizing the Internet as an inexpensive backbone for dial-up remote users. As a result, a new breed of access gear is appearing, such as the NOC 2000 and 4000 from New Oak Communications, Inc. The boxes rely on the Internet as the remote dial-up backbone. Users call their local ISP and establish a secure tunnel with a NOC server at the corporate site.

The NOC includes a firewall, encryption and strong authentication.

The NOC 4000 customizes access for each user, creating what the company calls personal extranets — limited access to the corporate network based on personal user profiles. New Oak, just 17 months old, in January was snapped up by Bay for $156 million.

The NOC device also could be used in service provider networks, supporting virtual private network (VPN) services. Customers would dial modems in the carrier network, clear security and connect to the corporate network over an aggregated broadband line.

While potentially saving money and reducing the need for staff to monitor and maintain remote access gear, some users are not interested.

Control over the equipment and security are more important to Michael Hegewald, manager of MIS and telecommunications at the New Jersey Sports and Exposition Authority. "I like the independence from the phone company, and I don't have to worry about how well somebody else is handling my remote access," he says.

That persistent attitude among users is likely to keep remote access concentrators in use in enterprises for a long time. ■

Carriers & ISPs

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Briefs

■ **Concentric Network Corp.,** *a Cupertino, Calif.-based Internet service provider, recently announced it will* **acquire InterNex Information Services, Inc.** *for $15.5 million. InterNex is a Santa Clara, Calif.-based ISP that offers dedicated Internet access and Web hosting services.*

InterNex currently supports almost 1,000 business customers. It has data centers in Santa Clara, Calif., San Francisco, Los Angeles, Chicago, Washington, D.C., Tokyo, Hong Kong and Stockholm, Switzerland. Concentric has data centers in Bay City, Mich., and Cupertino.

Concentric last week also announced it struck a deal with San Francisco-based competitive local exchange carrier **Covad Communications Co.** *to expand Concentric's digital subscriber line (DSL) services. Concentric now will be able to reach customers who want DSL Internet access services in the Bay area. Covad specializes in DSL services.*

✆ Concentric: (408) 342-2800

■ **MCI Communications Corp.** *has complained to the Federal Communications Commission about charges levied on its* **Mexican affiliate, Avantel.**

In an echo of domestic telecommunications fights, MCI said it will curtail investment in Avantel — a joint venture between MCI and a Mexican finance company — unless dominant carrier Telefonos de Mexico (Telmex) lowers network interconnection charges.

The FCC has leverage over the matter because it is reviewing a proposed alliance between Telmex and Sprint Corp. for seamless cross-border service offerings.

Glitch stalls FCC numbering plan

Local phone number portability may be delayed again by database problem.

By David Rohde
Washington, D.C.

A technical problem is threatening to delay yet again one of the key goals of telecommunications reform: the ability to change your local carrier without changing your telephone numbers.

The North American Numbering Council (NANC) last month informed the Federal Communications Commission that "vendor failure to provide a stable platform to support local number portability" may affect the FCC's mandate to make phone numbers portable starting March 31.

SOON TO BE ONLY ONE?

The two local number portability database administrators were assigned different parts of the country by original RBOC regions:

RBOC	Database administrators	
	Lockheed Martin	Perot Systems
Ameritech	☑	☐
Bell Atlantic	☑	☐
BellSouth	☐	☑
NYNEX	☑	☐
Pacific Telesis	☐	☑
Southwestern Bell	☑	☐
US WEST	☐	☑

The NANC's letter to FCC Common Carrier Bureau Chief Richard Metzger did not specify the vendor. But NANC officials told *Network World* it is Perot Systems, Inc. Perot Systems is one of two local number portability database administrators, along with Lockheed Martin Corp., responsible for setting up databases of local phone numbers to identify which carriers hold which phone numbers.

Today, users generally must change their phone numbers when they switch local exchange carriers because central office (CO) switches can only associate exchanges, or blocks of 10,000 numbers, with individual local carriers. The new FCC-ordered system is modeled after the one now used for 800 numbers, where users can port individual numbers to different carriers. A database lookup during call setup determines who carries the traffic.

Heather Burnett Gold, president of the Association for Local Telecommunications Services and a member of NANC's local number portability steering committee, said the problem resides in Perot Systems' database software, though she could not elaborate. A Perot Systems spokesman did not return phone calls.

The problem does not affect the entire country. Following the lead of carrier consortiums in each of the seven original Bell company regions, the FCC last year assigned Perot Systems to administer the database in three regions, while Lockheed Martin took the other four (see graphic).

Dropping databases

Greg Roberts, Lockheed Martin's director of number portability services, said Lockheed Martin's database has been tested and is working. Sources said the carrier groups in Perot Systems' regions may look to drop Perot Systems in favor of Lockheed Martin.

"It's safe to say that the other carrier consortiums have contacted us," Roberts said.

Even if they drop Perot Systems, the availability of number portability may be limited on the March 31 start date, which already was pushed back from the FCC's original Oct. 1, 1997 start date.

Carriers have 15 months to roll out portability to the 100 largest metropolitan areas, with only seven cities — one in each original Bell region — required to be up on March 31. And the availability of the database does not necessarily mean CO switches will be able to access the data.

According to Roberts, each carrier must build an electronic interface to the database based on the Telecommunications Management Network, a management protocol for carriers that uses the Common Management Information Protocol but has been slow to take off.

Responding to NANC's alarm, the FCC said it may give carriers in the affected regions the opportunity to apply for a 60-day waiver from the impending portability requirement possibly until March 1. ■

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Get more online:
- An overview of the number portability schedule
- Information about regional number portability

Internet roaming: Olympic style

By Denise Pappalardo

IPass, Inc. is making Internet access less costly for tourists, athletes and news media traveling to the XVIII Olympic Winter Games, in Nagano, Japan.

The Internet roaming consortium company inked a deal with NTT PC Communications, Inc., the Internet service provider division of Nippon Telegraph and Telephone Corp. (NTT), that will let iPass users in Nagano access their home-based ISP for the price of a local call.

IPass is a consortium of over 250 ISPs from around the world that form the iPass alliance network. This network allows users from any iPass alliance ISP to dial into the 'Net for the price of a local call in over 151 countries, using their regular logon and password. NTT PC is the latest addition to the iPass alliance network. Some domestic iPass ISP partners are UUNET Technologies, Inc., GTE Internetworking and CompuServe Network Services.

NTT PC has deployed iPass NetServer software in two of its point of presence sites in Nagano to support local Internet dial-up access.

Users attending the games can access NTT PC's NetServers by using their iPass dial wizard to find the appropriate local dial-in numbers.

When a user dials in to an NTT PC Nagano POP, the ISP's access server passes the user to an iPass NetServer. The NetServer then encrypts the user's name and password and sends the information to the nearest iPass Transaction Center, which in Nagano's case is in Honolulu, said Karen Chakmakian, director of marketing at iPass.

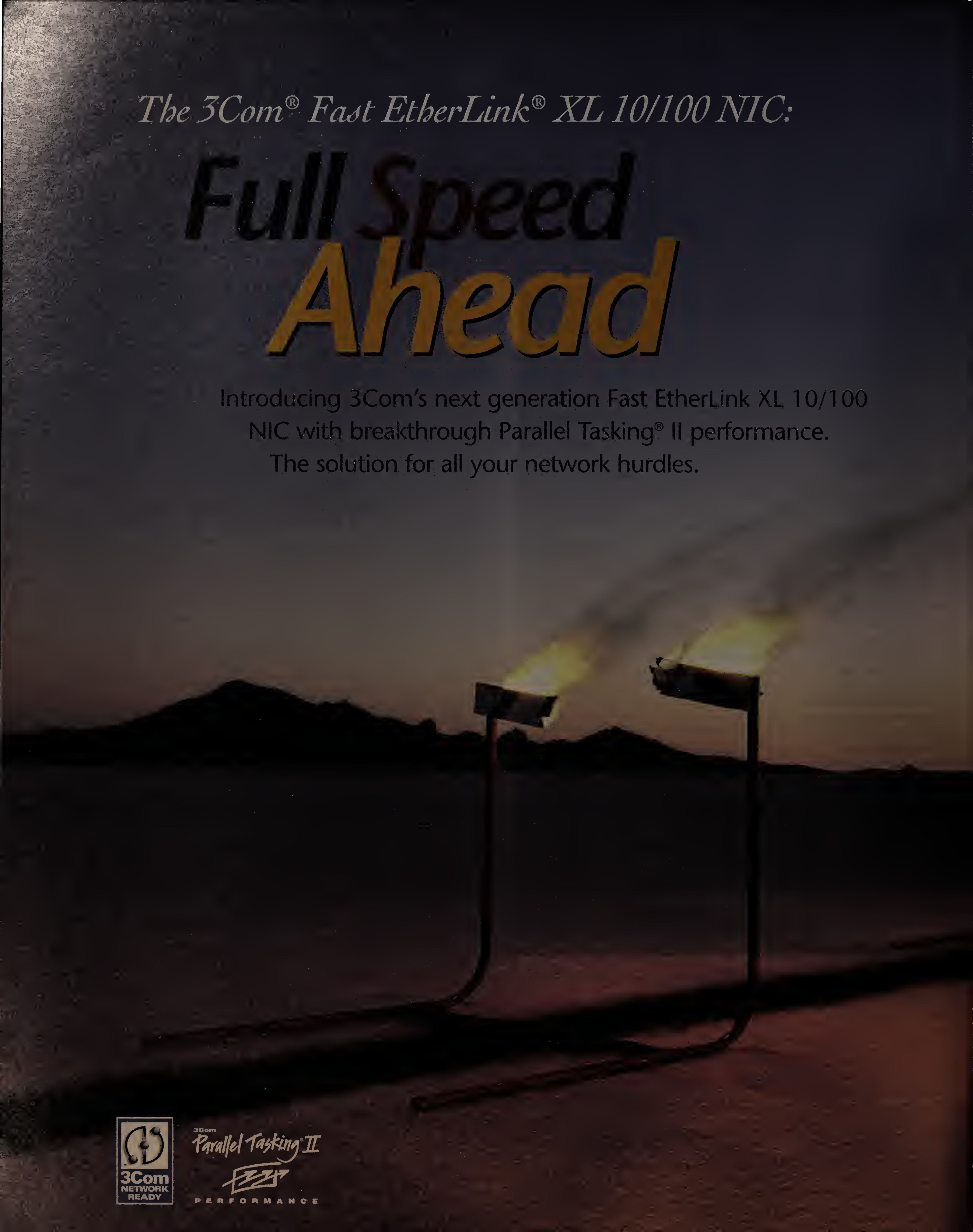
The Transaction Center then sends the user's domain name and IP address to the customer's home ISP for final authentication. If the user is authenticated, he is then online.

Pricing for the calls from Nagano, or any other city, depends on the individual iPass ISP partner. But iPass said the charges typically range between five to 20 cents per minute.

Computing the length of the call and billing is handled by iPass' Transaction Center, which sends the final settlement information to the appropriate ISP.

While iPass already had four Japan-based ISP partners, including Rimnet Corp. and NEC-Biglobe, NEC Corp.'s ISP partner, iPass did not have a presence in Nagano, Chakmakian said. This is why signing a deal with NTT PC or another provider that had access in the Olympic city was imperative to iPass, she said.

IPass wanted to provide its ISP partners the opportunity to offer their customers local access to the Internet if they were traveling to Japan to be a part of the Olympic games, she said. ■



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WAN MONITOR

Reversing a trend with VPNs

Most new network technologies trickle into the market from the top down. That is, the largest network users play around with the technology for a few months and test its merits. Only after that would smaller users take a chance on new technology.

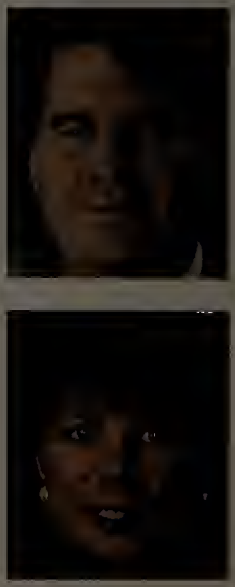
Virtual private networks (VPN) may reverse this trend. TeleChoice suspects that small and mid-size businesses will pull VPN services to market and that large businesses will lag in VPN adoption.

Because there are as many definitions for VPNs as there are people talking about them, let's start by narrowing the definition. TeleChoice typically segments VPNs into two parts: those based on closed IP networks dedicated to business users and those that are based on the public Internet and use security, tunneling and authentication to deliver a secured service. Access to either arrangement can be dial-up or dedicated.

VPNs are attractive for one main reason: low price. Most small and mid-size businesses need a cost-effective way to connect small, remote locations. They need to exchange e-mail, files and other information with their employees, suppliers and customers. They don't have a staff of in-house resources to install and manage a WAN.

The benefits other technologies such as private lines or frame relay deliver, such as highly predictable performance, guaranteed bandwidth and unquestionable security, are important to large businesses running highly mission-critical applications.

The mid-size company uses the network to facilitate business communications and needs a service that is reasonably predictable in its performance, delivers reasonable latency and doesn't require a technician to install and maintain it.


Daniel Briere and Christine Heckart

Many Internet service providers and a few of the major carriers today offer VPN packages. For example, Concentric Networks offers a closed IP network that runs over an ATM infrastructure and comes with end-to-end latency service-level agreements (SLA).

The service manages the router, firewall and encryption device, plus it delivers the LAN and WAN. The price per site is about $1,095 for 64K bit/sec dedicated access, which is actually delivered on a T-1, so the customer can burst above 64K bit/sec if necessary, or $1.85 to $2.55 per hour for dial access, depending on commitments.

Similarly, ANS Communications offers a VPN service on a native IP network. ANS offers SLAs for network availability that actually cover customer premises equipment, network port, router, encryption device and the local loop. Pricing for the ANS VPN service is about $2,100 per month for a full T-1 and includes all the elements listed above, except for the local loop. Not bad.

Large end users will deploy more VPNs as people become more comfortable with the security packages and as VPNs mature in their ability to support voice and video and deliver predictable performance and guaranteed bandwidth.

Briere is president and Heckart is vice president of TeleChoice, Inc., a consultancy in Verona, N.J. They can be reached at dbriere@telechoice.com and checkart@telechoice.com.

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Presented by Cathy Gadecki, TeleChoice, Inc.

NetworkWorld TECHNICAL SEMINARS

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Discovering How ATM Fits In Your Network

SEMINAR OVERVIEW

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ATM Integration: Discovering How ATM Fits In Your Network is designed to help you discover ATM's fit into your local and wide area network architecture. ATM Integration explores the capabilities and benefits of ATM and carefully examines its interoperability with multiple legacy environments including ethernet, token ring, FDDI, frame relay, voice and IP.

The seminar is taught by leading ATM expert Cathy Gadecki of TeleChoice, Inc. Cathy is co-author of the popular *ATM For Dummies®* from IDG Books Worldwide with over 10,000 copies sold in its first six months. You will learn more about ATM, its uses, alternatives and criteria for evaluating ATM vendors. You will leave the seminar with the information needed to help you decide whether to and how to implement ATM in your own enterprise network.

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5. Explore how you can use ATM in your WAN to unplug your frame relay bottlenecks and increase Internet connection speeds.
6. Uncover the facts on using ATM to carry voice traffic.
7. Investigate practical strategies for transitioning your current network to a LAN or WAN ATM backbone.
8. Compare and contrast ATM to other solutions for the campus and wide area networks.
9. Learn three ways to send IP traffic over an ATM network.
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Briefs

■ **PictureTel Corp.,** *recently battered by disappointing sales and class-action stockholder lawsuits, has named* **Bruce Bond** *as its new president and CEO. Bond, who will succeed Norman Gaut effective March 1, takes over the Andover, Mass., videoconferencing company after having served as CEO of ANS.*

■ **Autonomy, Inc.,** *a British start-up that makes agent-based software, tomorrow will announce products aimed at the burgeoning knowledge management market.* **Autonomy Knowledge Server** *uses pattern recognition technology to automate the categorization, cross-referencing and presentation of information for enterprise workers. Server-side software called* **Knowledge Update** *can monitor specified Internet and intranet servers to create personalized reports. Autonomy's software runs on Windows NT and most versions of Unix.*

Knowledge Server ranges in price from $50 to $100 per seat, while Knowledge Update costs $5,000. Both are scheduled to ship in early March.

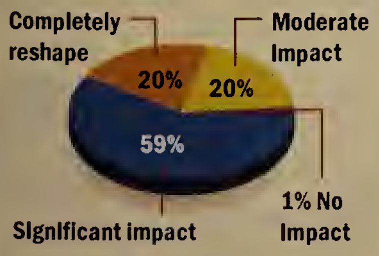
© Autonomy: (415) 243-9955

■ *Security vendor* **eSafe Technologies, Inc.** *is shipping ViruSafe Firewall 1.5, antivirus software that works with firewalls to block unwanted* **Java** *or* **ActiveX** *applets, terminate denial-of-service attacks and guard against known virus threats.*

© eSafe: (888) 772-3372

E-COMMERCE EFFECTS

When asked how electronic commerce would affect their industry, 377 CEOs said:



SOURCE: PRICE WATERHOUSE, BETHESDA, MD.

The story behind the relational database numbers

Changing customer buying patterns bolster Windows NT database sales, but Unix database revenue growth lags.

By John Cox

The database vendors' raw revenue numbers seem to create a clear picture: Unix relational databases are fading, while Windows NT packages are hot.

But what the numbers fail to show are several complex trends developing as MIS groups struggle to manage the information flood created by the World Wide Web and the Internet.

Users and systems integrators report:

- The shift of applications from mainframes to client/server Unix systems has slowed
- Custom-built Windows NT database applications have proliferated less widely than expected
- Unix databases still are the popular choice for the biggest and most important applications
- File systems and object databases are winning out over relational databases for anchoring high-performance and transaction-oriented Web sites

The upshot of all this is that 1997 was a tough year for database vendors, most of which experienced anemic revenue growth.

However, NT database sales are surging. Between 1995 and 1996, the two most recent years for which final data is available, Microsoft Corp.'s SQL Server revenue more than doubled. And Microsoft's growth was the slowest among the top five vendors: IBM revenue for DB2 on NT grew from a half million dollars to $31.2 million.

By contrast, Oracle Corp.'s Unix revenue grew 21.5%, and Sybase, Inc. saw its Unix database revenue drop by about 14%.

"Once we see momentum [building] toward Web-based applications, and the systems infrastructure needed to support them [is in place], you'll see [overall] database demand build again," said Steve McClure, an analyst with International Data Corp., in Framingham, Mass.

But many MIS groups seem to have all the Unix databases they need, at least for now.

"We used to go into [MIS groups] that were transitioning to client/server and one of their [biggest] decisions was always 'What relational database do we choose?' " said Larry Podmolik, director of technology at Strategic Technology Resources, Inc., a systems integrator in Chicago. "Now these MIS departments have standardized on one or the other of the relational database vendors. So, we almost never see a first-time database customer anymore."

In other cases, the stampede from mainframes to client/server systems seems to have slowed. "People now see their mainframes as very effective, big servers," said Michael Prince, chief information officer for Burlington Coat Factory Warehouse, Inc., of Burlington, N.J. "So they're keeping applications on the mainframe."

Even the booming NT database market is affected by these realities. One adopter of Microsoft SQL Server on NT was The Darby Group Companies, in Westbury, N.Y., but the company never realized an expected explosion in demand for database applications among end users. "We've just not gone ahead and written a whole bunch of [SQL Server] applications, and our mainframe still handles all our transaction processing," said Peter Bavoso, vice president of information systems.

For new Web applications, users are turning to an array of different technologies to manage data.

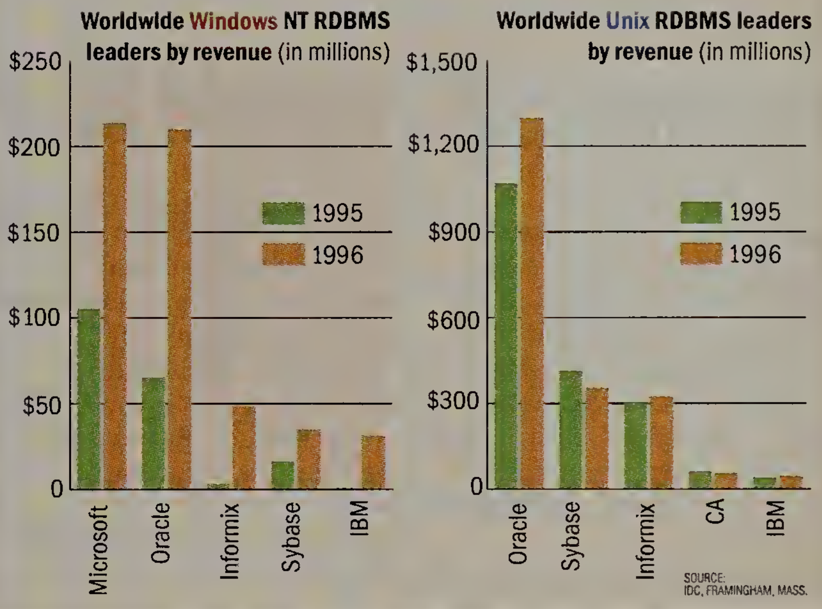
"In most of the Internet applications, the storage and retrieval mechanism of choice is a file system," said Nelson Carbonelle, president of Alta Software, Inc., a Reston, Va. custom software developer. Most of these applications still are based on HTML and use URL names, for which a relational database management system is overkill, he said.

For some advanced Web sites, object databases are the key to transaction applications, according to Dan Woods, director of editorial technology for Time, Inc.'s New Media group, in New York. "Relational databases don't deliver on the performance end," he said. ■

NT DATABASE GROWTH SPURT

Windows and Unix database revenue growth rates (1995 to 1996)

	Microsoft	Oracle	Informix	Sybase	IBM	CA
Windows	104%	223%	1,501%	118%	6,142%	165%
Unix	–	22%	8%	-14%	19%	-6%



SOURCE: IDC, FRAMINGHAM, MASS.

E-comm server gets a boost

By Ellen Messmer

Open Market, Inc. is adding muscle to its Transact electronic commerce processing server through more payment options, order-fulfillment functions and multilanguage support.

Set to ship by the end of March, the Transact 4.0 server will be able to handle payments based on the Internet credit card processing standard, Secure Electronic Transactions.

The latest version of Transact also has Open Market's own "microtransactions" technology that lets shoppers prepay or get billed later for small online purchases.

Transact is a specialized server that sits behind the corporate Web server and handles electronic commerce-related tasks. The next version of Transact will come equipped with what Open Market calls "an Open Injection API" intended to make it easy for the server to work with applications, such as a business-to-business order-approval system.

"We also now have a 'Partial Shipment Capability' that lets sellers handle the exceptions and back orders," said Gail Goodman, vice president of Open Market's commerce products group.

Other upgrades include multilanguage buyer screens in English, French, German and Japanese, plus a way to download transaction data and integrate financial information into accounting packages.

Transact 4.0 will cost $125,000 if licensed by a corporation for its own use, or $250,000 for a business acting as a service provider.

© Open Market: (781) 359-3000

WEB WATCH: PART THREE

They're not start-ups anymore

By Chris Nerney

A year ago we introduced Network World *readers to three Internet start-ups: BackWeb Technologies, HAHT Software, Inc. and Novera Software, Inc. Our goal was to track the companies over the course of 1997 to see how each navigated its market: push technology (BackWeb), Web applications platforms (HAHT) and Java-based network operating systems (Novera). While it is still too early to declare any of these companies successes or failures, all three seem well-positioned and well-financed for the competitive battles that lay ahead. What follows are summaries of where the companies have been and where they may be going in the year ahead.*

BackWeb pulls back on push

San Jose, Calif.

A year ago, BackWeb Technologies, Inc.'s goal was to be on the "short list" of push technology vendors.

By spring, the company had achieved that goal, finding itself mentioned along with PointCast, Inc. and Marimba, Inc. as the most formidable push players.

Today, however, BackWeb executives barely mention push, even though the company's primary product remains its push channel server software, which enables Web site owners to create personalized Internet channels to deliver content to desktops. Instead, company officials tout the benefits of knowledge management, and how BackWeb can deliver critical data to enterprise workers.

COMPANY ACTIVITY REPORT

BACKWEB: YEAR IN REVIEW

March 1997
Announced partnership with Microsoft to supply broadcast channels for Internet Explorer 4.0 browser.

June 1997
Released final version of BackWeb 2.0.

July 1997
Acquired rival push vendor Lanacom, of Toronto.

December 1997
Entered knowledge management market with BackWeb Infocenter 4.0, client/server software.

VP of Marketing Selander

CINDY CHARLES

BackWeb's abrupt shift in message — the company had never publicly mentioned knowledge management until December — does not represent a change in strategy, says marketing Vice President Kelsey Selander. "All we're doing is moving from discussing features to discussing benefits," Selander says.

Perhaps, but the firm's focus away from push came after the industry's infatuation with the Web-based technology ended.

While definitions vary, knowledge management is the utilization of various technologies to allow companies to get the right information into the hands of the right end users when they need it. The Gartner Group, Inc. forecasts a $5 billion market for knowledge management products and services by the year 2000.

All this led BackWeb to reposition its version of push technology as one crucial element of an entire enterprise knowledge management strategy. Selander says BackWeb's new message will pay off in the company's new market. "We have a chance to claim this space and be the hot application," she says. ■

HAHT hones in on enterprise customers

Raleigh, N.C.

The Web applications development tool market is growing, yet opportunities are shrinking.

That's the competitive landscape start-up HAHT Software, Inc. faces.

The company was the first to market a Web integrated development environment (IDE), launching its HAHTsite software in late 1995. Since then the market has attracted quite a crowd. NetDynamics, Inc., Wallop Software, Inc. and SilverStream Software, Inc. are among the start-ups competing with HAHT for enterprise customers.

Then there's Microsoft Corp., whose Visual InterDev IDE holds one huge advantage over the other companies' products: It's free.

HAHT's response to the InterDev challenge is to cede a segment of the enterprise market to Microsoft. "If [users] can do what [they] need to do with InterDev, it's not the right place for us to be competing," says Chairman Richard Holcomb.

Instead, HAHT focuses only on customers whose network application needs dwarf InterDev's capabilities.

"Our customer list isn't Fortune 500 companies," Holcomb says. "It's Fortune 100.

"The stuff we're doing, you can't do with InterDev for any number of reasons," he says. "InterDev is stuck within the Microsoft framework. Most of our customers are deploying on Unix servers."

HAHT has done well enough to recently attract $14.4 million in venture capital during the its third round of funding. ■

COMPANY ACTIVITY REPORT

HAHT: YEAR IN REVIEW

February 1997
Shipped HAHTsite 2.0.

June 1997
Co-founder and President Jim Hebert leaves company; Chief Operating Officer Rowland Archer becomes president and CEO; Richard Holcomb remains as chairman.

September 1997
Shipped HAHTsite 3.0 with full Java support.

January 1998
Announced $14.4 million venture capital round.

Chairman Holcomb

CHARLES GUPTON

Novera targets new Java developers

Burlington, Mass.

Novera Software, Inc. is meeting the market halfway.

In early 1997, founder and CEO Herb Rush knew there would be demand for software that would allow enterprises to build and deploy Web-based Java applications. He and other Novera executives thought the company's Enterprise Platform Internet Computing (EPIC) software would fill this need.

COMPANY ACTIVITY REPORT

NOVERA: YEAR IN REVIEW

March 1997
Announced Novera EPIC 1.1, the first release designed for corporate intranets.

July 1997
Received $4.7 million in venture funding.

November 1997
Signed 10-year deal with home improvement retailer The Home Depot, which will use EPIC as platform for Java-based applications in 700 stores.

December 1997
Released EPIC 2.0.

CEO Rush

STELLA JOHNSON

EPIC's server software is designed to develop and deploy Java business applications that run across corporate intranets and the 'Net. This allows client and server applications access to directory services, file and print services, the Internet, e-mail gateways and relational databases.

But as Rush and other Novera executives pitched prospective customers on the virtues of EPIC, they realized that even if companies were willing, they were not necessarily ready. "A lot of programmers just couldn't use our stuff," Rush says. "They didn't know enough about Java." Further, many IT managers harbored doubts about whether the programming language could be used across their networks.

Novera tried to address these problems last quarter, releasing three products: a database access builder, calendar software and mainframe access builder. The products are designed to make it easier for corporate developers to create Java applications that end users can run anywhere on a network.

"Now we can go in and show [potential customers] how to access their data," Rush says. "We were doing it before, but to appreciate it you had to be really technical."

Novera has attracted enough attention to be mentioned as a possible buyout target. The company is not for sale, but Rush would listen to reasonable offers. ■

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NET INSIDER

Representing the people

How can real people be represented in the technology regulatory decision-making process or, in fact, should they be?

Much of the telecommunications world, as with just about all other endeavors, exists in an environment of competition constrained by regulations. There are regulations about what level of electromagnetic radiation signals on telephone wires can emit, what height buildings are permitted to be in various locations, how employees must be compensated for their work and how many cable TV companies can offer service in a town.

Soon there will be still more regulations covering the number of Internet top-level domains, Internet-based commerce and, in many countries, Internet content.

These regulations are made by various governmental boards following legislative actions of one degree of clarity or another. Where in this process is the voice of the individual heard? Some claim can be made that because elected officials were involved in the original legislation, there is such a path, but few would claim that there is any such input in the governmental boards.

Historically, the more local the regulatory board, the more likely it is to be dominated by business interests. The perfect example of this is state and local utility commissions. The Baby Bells are suing to get the FCC out of the business of establishing the rules by which these regional monopolies can compete in the long-distance telephone market.

They are not doing this because of any desire to have the input of us telephone users impact the rules. They are doing it because the state utility commissions are seen as far more friendly to the aims of the phone companies than is the FCC.

Scott Bradner

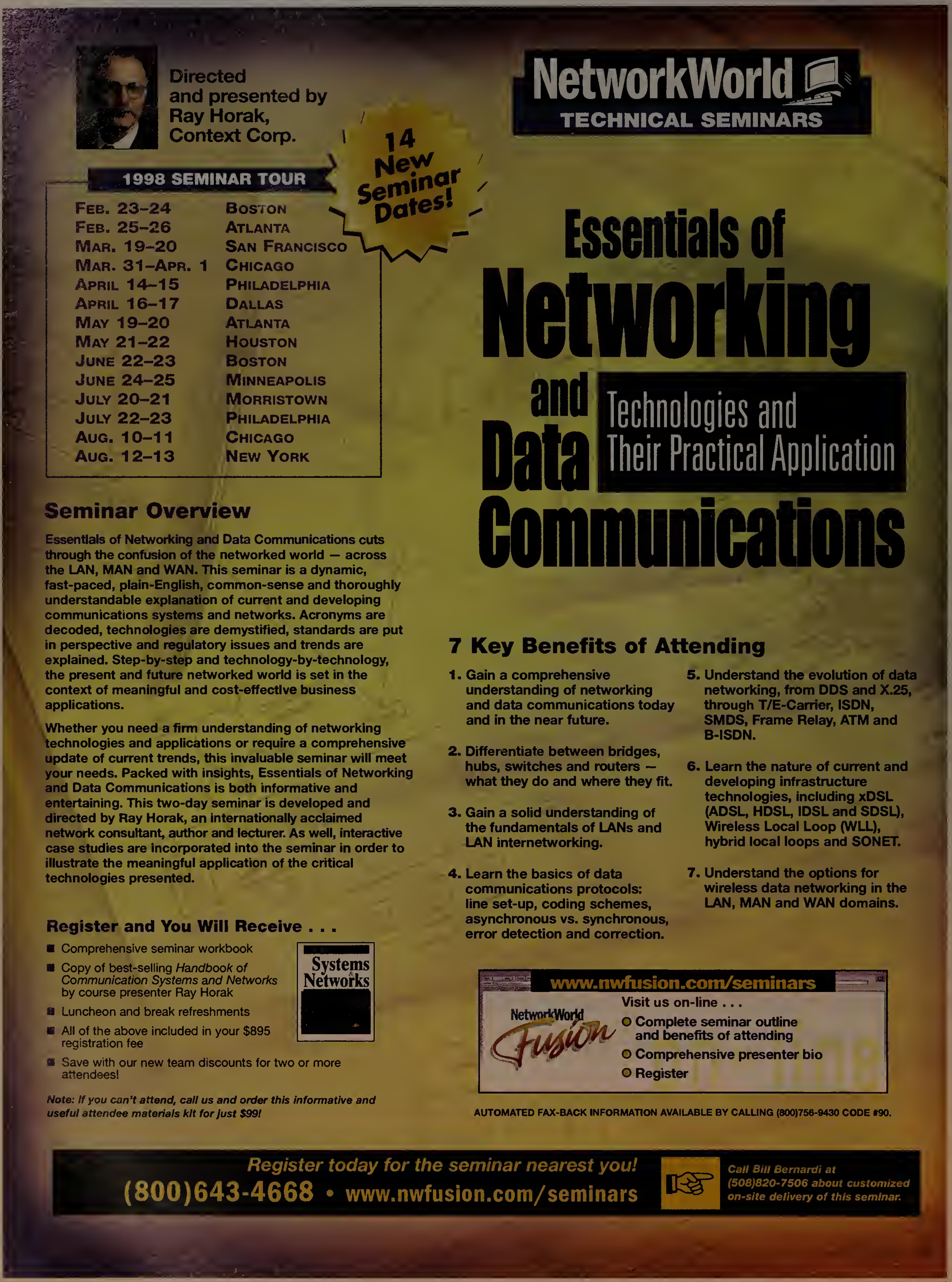
One of the reasons that any regulatory body has a tendency to favor commercial interests rather than end users is the level of technical expertise required. Frequently, the only people with the expertise are people from the very businesses that will be subject to the regulations.

The issue of getting more nonbusiness input to these rule-setting processes has been around for quite a while and is not limited to the upcoming rules for the Internet. However, a number of people are starting to worry quite a bit about the issue in the aftermath of the Clinton administration's Green Paper. The reasoning is that the Internet is for the people, so the people on the 'Net should have a say in the rules. It should be noted that there is a very high percentage of libertarians and other people on the 'Net who do not trust governments to represent their interests on the Internet.

But just saying that users should have input begs the question of how and when. It does not seem to be logical to have 50 million Internet users vote to approve a new top-level domain name. I have quite a bit of sympathy for the concept, but I have seen enough eloquent demonstrations of low clue density on Internet mailing lists to dread having the future of the Internet dependent on the reasoned opinions of retired fireplug painters and hormonally augmented teenagers.

Disclaimer: Harvard is not the average end user so its views might be quite different from mine.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.



Directed and presented by Ray Horak, Context Corp.

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Seminar Overview

Essentials of Networking and Data Communications cuts through the confusion of the networked world — across the LAN, MAN and WAN. This seminar is a dynamic, fast-paced, plain-English, common-sense and thoroughly understandable explanation of current and developing communications systems and networks. Acronyms are decoded, technologies are demystified, standards are put in perspective and regulatory issues and trends are explained. Step-by-step and technology-by-technology, the present and future networked world is set in the context of meaningful and cost-effective business applications.

Whether you need a firm understanding of networking technologies and applications or require a comprehensive update of current trends, this invaluable seminar will meet your needs. Packed with insights, Essentials of Networking and Data Communications is both informative and entertaining. This two-day seminar is developed and directed by Ray Horak, an internationally acclaimed network consultant, author and lecturer. As well, interactive case studies are incorporated into the seminar in order to illustrate the meaningful application of the critical technologies presented.

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Technology Update

Covering: Evolving Technologies and Standards

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Ron Nutter, a Master Certified Novell Engineer and Groupware CNE in the Lexington, Ky., area, tracks down the answers to your questions. Call (800) 622-1108, Ext. 7476, or send your questions to rnutter@world.std.com.

We have about 50 Windows 95 PCs on a NetWare 4.11 LAN to which we have added an NT server to run Microsoft Exchange. The Windows 95 PCs run either an early 1997 version of NetWare Client 32 or the new IntranetWare Client Version 2.2. When we added the Microsoft network client for domain authentication, the performance of file operations slowed dramatically.

We've found that when we install the IntranetWare client before the others, the problem does not occur. However, that does not mean we can fix the problem by removing the other clients and then installing the IntranetWare client. Only cleaning off the hard drive, reinstalling Windows 95 and then installing the IntranetWare client fixes it — and that's a process we'd prefer not to have to do to all the computers.

Do you know of an alternative?

Via NW Fusion

It sounds as if you've got a problem with the registry, which is created when you install Windows 95 on a fresh machine. I have had good success copying setup.exe and all the files from the Windows 95 diskettes or CD to a directory called Windows Options Cabs and running the setup process from there after booting Windows 95 to a safe-mode DOS prompt. This directory path is one commonly used on OEM preloaded versions of Windows 95.

In most cases, this procedure retains all the settings added after the workstation is installed but "cleans up" the Windows registry. This could be a viable alternative to reformatting the drive prior to reinstalling Windows 95. In addition, try downloading the w95unc.exe file from Novell, Inc.'s Web site. This file will remove all entries from the registry pertaining to the Novell client.

And as long as you're not using the OSR2 or Rev B versions of Windows 95, you should head to the Microsoft Corp. Web site to download and apply the Service Pack 1 and krnlupd.exe.

Extranets: The keys to the corporate kingdom?

Internet technologies help build secure, collaborative network environments.

By Thomas J. Pincince

Can the Internet be effectively used to generate revenue? It can be, especially with the help of an extranet.

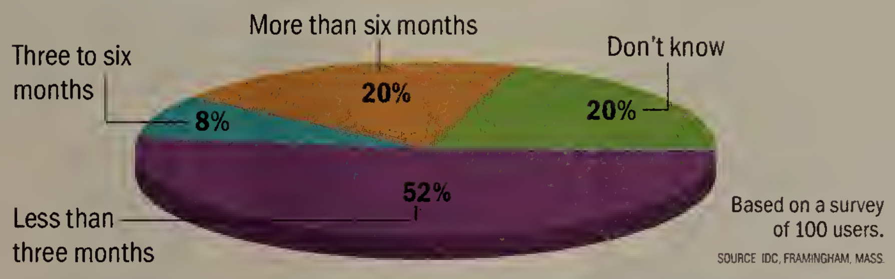
Extranets have become, in the past year or so, a way for corporations to begin opening their intranets to external partners. Intranets, which are built on open, public Internet standards, enable organizations to quickly deploy internal applications without costly and proprietary implementations.

UP CLOSE

Extranet savings

A corporation with 1,000 remote users can expect to save $1 million per year by moving away from traditional remote access and adopting extranet access. The savings come in several areas:

Payback time for an extranet



Based on a survey of 100 users.

SOURCE: IDC, FRAMINGHAM, MASS.

Fixed costs: Internet service provider's hourly access or fixed-cost fees are up to 50% cheaper than the best toll-free rates. Capital spending also is greatly reduced because the physical network is moved to the carrier cloud.

Management costs: Corporations will lower management expenses because an extranet allows network managers to outsource the management of the network to service providers.

Equipment costs: The equipment necessary to build an extranet is up to 80% less expensive than legacy remote access products with similar capacity.

Extranets create an electronic link between a corporation and its partners by opening up new markets, lowering costs and reducing technology churn.

In an extranet, a corporation's employees and business partners use Internet technologies for safe communication, collaboration and commerce.

Extranets enable individuals and groups to collaborate to achieve common business goals. Extranets also allow a corporation to refocus attention from technology toward the elements that make a business run.

An extranet utilizes the Internet to provide corporate partners access to critical information. And instead of employees dialing in to a remote access server, they connect to the Internet from anywhere in the world through a secure connection for safe access to corporate data.

Rather than using costly and restrictive electronic data interchange formats on value-added networks, companies can set up extranets for an open dialogue between customers and suppliers over the 'Net.

Extranet applications range from simple file sharing to critical business transactions among partners. Suppliers, customers and other partners can also connect through an Internet service provider to gather critical information on extranets.

'Net collaboration

Extranets enable secure, ongoing collaboration over the Internet. This means that a parts supplier and the engineer from an automobile manufacturer can design a new product by viewing and editing CAD files at the same time over the Internet. Extranet links between suppliers and buyers can give electronic commerce a big boost by improving supply-chain management.

In addition, employees are provided the same reliable access to the corporate network at any time, from any location.

For example, a traveling salesperson could access sales data that is crucial to closing a new deal. Rather than having to fax information to a potential client at a later date, salespeople can have the data at their fingertips, greatly increasing their ability to make a sale.

The business benefits of an extranet are potentially huge. Extranets greatly increase the speed and efficiency with which employees and partners can access each other.

With extranets, customers no longer have to make a phone call for the most up-to-date product availability or pricing information. Rather, they access corporate databases via the Internet to quickly locate the precise information they require.

Business managers can see significant cost savings by building an extranet. Traveling or work-at-home employees access corporate databases, mail servers and file servers via the Internet rather than dialing in to premise-based remote access servers. Remote users access an extranet by dialing in through a local ISP, rather than into a premise-based remote access server.

Traditional remote access systems do not support extranet access. Scaling up these systems is difficult and costly. Expensive hardware upgrades, hefty management costs, and long-distance and toll-free dial-in charges for each user can quickly wipe out a corporate remote access budget. Extranet access requires products specifically designed for this purpose.

Opening the enterprise

Building extranets usually takes lots of coordination between the company and its business partners. Opening up enterprise databases can be a tricky proposition. Databases, applications and other important corporate data must be protected via firewalls, data encryption or some combination of the two.

Two elements are key for smooth extranet operations: a complete extranet package, like those from Netscape Communications Corp., Lotus Development Corp. or Bay Networks, Inc. (in the form of its recently purchased New Oak Communications, Inc. extranet switch) and the right access service provider.

When choosing a service provider, a corporation should select one that will render a high-performance, low-latency network, dial-in port availability and service guarantees. More important than price will be the business practices and technical value of the network.

Pincince is vice president of business development at Bay Networks. He was formerly executive vice president of New Oak Communications, Inc., a provider of extranet products. Bay Networks recently bought New Oak. He can be reached at (978) 266-1011 or tpincince@baynetworks.com.

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EDITORIAL insights

Why I don't like service-level agreements

One of the hot topics in networking circles these days is ''service-level agreements,'' or SLAs.

Pundits of all stripes — including some who've written on these very pages — are encouraging network managers to draft SLAs guaranteeing specific levels of network performance they'll provide to other departments.

SLA proponents say these agreements ensure that IT and business units have a common understanding of what the network can and cannot do. They argue that SLAs can free up funding for network departments because they clarify the investments required to achieve desired performance levels.

I'm not going to deny those benefits. But I'm warning you that SLAs come with a very high price tag. That is, SLAs reinforce the dangerous notion that your department is simply a service provider and not a driver of new business opportunities. And that doesn't bode well for the department's future or your own.

That point was brought home during a ComNet session on network management. Fellow panelist Jim Griffin, CIO at Geffen Records, gave quite a stirring speech about the need for network professionals to shepherd their companies into the future. For his part, Griffin has helped Geffen executives understand the challenges and opportunities involved in the digital distribution of entertainment.

Griffin said he would consider himself a failure if he could only t about improving network uptime or trimming application respons time. What he wants to tell upper management is how networking h opened up new lines of business and brought in new revenue.

You may not be able to discuss such achievements if your depar ment is saddled with an SLA. Your efforts will, quite naturally, be focused on meeting the terms of the agreement, not on innovating through networking. You and your staff will be viewed as contractor living up to the details of a business deal.

Having discussed SLAs in my presentation, I asked audience me bers how many were working under such agreements. Six or seven ple raised their hands. I asked them whether my fear about SLAs wa warranted. For the most part, the answer was ''yes.''

Financial types like SLAs because they limit costs and take some the uncertainty out of IT. But they can hamstring your department keep you from playing a leadership role in the company.

Like Jim Griffin, I believe your future success, as well as the succ of your department rests on your ability to take your company's bus ness to the next level, to bring in new customers and profit. Don't l SLAs keep you from doing that.

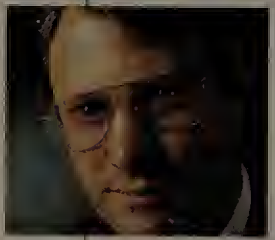
John Gallant, editor in chief jgallant@nww.c

Intranet Adviser • Daniel Blum

Once just annoying, now spam is a real threat

''Reprint rights to riches!'' read the subject line of one of the many unsolicited bulk e-mail transmissions I've received recently.

Most such transmissions, known as spam, emanate from opportunists who use forged addresses that you can't reply to. Others come from legitimate advertisers. But this message appeared to come from a sterling source: myself. Its sender was listed as ''Daniel Blum.''



Worried that other users had also received spam that was supposedly from me, I complained to the ISP. I received the following response: ''The spamming software used to send this uses the recipient's address as the sender's address. There is no telling who else this went to, but it will not appear that it came from you.''

The sender's program had forged my address in order to avoid being filtered out by ISP spam-blocking services. My ISP offers a free ''spaminator'' service, which maintains a kill file of spam-sending domains and originators whose messages will be blocked.

Spam is a growing problem that has gradually escalated from merely annoying users to raising enterprise costs to ultimately threatening the openness and integrity of the Internet.

According to an Internet Mail Consortium (IMC) report on unsolicited bulk e-mail, ''Spam costs money to every recipient, as if it was sent postage due.'' Many users spend connect time, long-distance call time, personal time and company time opening, identifying, sorting and deleting spam. Aggregated across 200 million e-mail users, these costs are very high, even before taking into account the bandwidth, help desks and filtering resources expended by enterprises and ISPs.

But perhaps the greatest cost of spam is the degrading effect it has on e-mail. You can no longer really be sure that the messages you receive are what they appear to be.

So what are we going to do about spam? The IMC report I mentioned analyzes the effects of solutions that involve filtering, legislation and content labeling. But the report's authors aren't optimistic that any of these solutions — taken alone — can solve the problem.

At a minimum, we should make it illegal to forge e-mail sender addresses, but this is hard to do because the Internet does not belong to any one country. Enterprises should buy messaging software that maintains kill files at the firewall, but some spam will come in under the radar and some legitimate messages will inadvertently be deleted. ISPs should singly and as a group enforce acceptable-use policies, but dishonest spammers will find a way to evade them. Content labeling of unsolicited bulk e-mail is great, but it too can be evaded and must work in conjunction with filters.

What is clear is that everyone should use digital signatures, particularly if you are in upper management or deal with the public. In the short term, digital signatures at least make it much more difficult for someone to forge e-mail addresses so messages would appear to come from your company. In the long term, corporate messaging firewalls can validate that incoming messages are signed with a digital ID issued by an acceptable certifier — one that doesn't do business with spammers.

In addition, you should make it a priority to deploy technologies such as Secure Multi-purpose Internet Mail Extensions secure messaging, Open PGP, Lightweight Directory Access Protocol directories and X.509 public-key certificate authorities across your intranet and among your extranet trading partners. This will provide accountability and reduce the risk of fraud. Go ahead and send me e-mail — in your name only, please — if you'd like advice or help on such a project.

Blum is a principal at Rapport Communication, a consultancy that provides enterprise messaging, directory and groupware consulting and information services. He can be reached at dblum@mindspring.com or www.rapport.com.

MESSAGE QUEUE

Send letters to nwnews@nww.com or John Galla editor in chief, Network World, *161 Worcester Framingham, MA 01701. Please include phon ber and address for verification.*

Microsoft versus the DOJ

Editor's note: To accompany o ''Head to-Head'' on whether the Justice D rtment is justified in going after Microso bundling practices (Jan. 26, page 41 ve set up an online forum on Network W ld Fusion and asked readers for thei ews. Here are some of their responses:

There is nothing wrong with icrosoft bundling its browser with W dows 95. You can still install Netscap aviga-tor, so what's the big deal?

I work for an Internet servic rovider and think it's very nice of cro-soft to include Internet Explor on the desktop. This gives us a uniform vay of

MIT and Digital: Take an F for the decade

I recently delivered the keynote address at the Massachusetts Institute of Technology's forum on the future of the Internet. The room was chock-full of Digital Equipment employees, and the hidden agenda was the future of Digital. Even then, rumors of a merger with Compaq were rampant. Here was my message:

Forbes magazine recently published its list of the 200 wealthiest individuals in high technology. Where were you, MIT graduates? Where were you, Digital alumni? Nowhere. Nada. Not a one.

Topping the list were West Coast high-tech entrepreneurs, founders of companies such as Intel, Microsoft, Netscape, Sun Microsystems and Cisco. The list abounded with Berkeley and Stanford engineers and Hewlett-Packard alumni.

No. 1 on *Forbes'* list? Bill Gates—a Harvard dropout, for God's sake. Slightly further down was Steve Ballmer, a Harvard hall mate of Gates'. Wealth seems to be directly proportional to the distance from Bill's former dorm room but does not extend to Digital headquarters in Maynard, Mass.

Digital was the original "hot box" company. Its engineers were revolutionaries. Its secret weapon was its users, who were the smartest in the business. They would grab each hot box, correct Digital's manual, trade software with one another and thank Digital for the opportunity. And who developed those boxes? MIT engineers.

But somewhere, Digital lost its way. The hot boxes were suddenly coming from Apollo or Sun or Silicon Graphics or HP. When Gordon Bell developed the idea of a modular computer family, DECnet was the glue that held it together. Today, internetworking is a multibillion-dollar business that Digital, more than any company, should have owned.

Suddenly, the world moved at hyperspeed. The West Coast techies learned about the tight coupling between developing silicon and hardware, while Digital was still thinking that development was an orderly process.

MIT and Digital have always had an implicit contract with the greater Boston area. You, MIT graduates and Digital alumni, have broken that contract, and I want to know why. Let me remind you of its provisions: You will be accepted at arguably the finest technology university on the face of the earth, or you will go to work for one of the leading computer innovators in the history of the industry. You will settle in Boston, marry attractive and equally brainy spouses from the Boston area and begin families.

And you will start insanely great companies within the shadow of the MIT Golden Dome or the Digital Mill. These companies will grow like crazy, providing employment for thousands of Massachusetts residents and creating even more spinoffs. Do you think your spouses married you for your athletic prowess? Your social skills? Your good looks? Did they want your body or your brains? I have seen your bodies. Enough said.

The Yankee Group recently completed its yearly list of the 200 most important companies in computers and communications. Where once Massachusetts would have led, today it is an afterthought. Chipcom has been sold to 3Com and disbanded, Digital's network group has been sold to Cabletron, and now Digital itself has been sold to Compaq. The Internet—for all intents and purposes, the most important technical development since the semiconductor—was invented at MIT and perfected at Digital, yet the companies that are benefiting most seem to be everywhere but Massachusetts. Examples: Cisco, a Stanford spinoff, and Sun, run by Scott McNealy, an ex-Harvard hockey player. MIT and Digital, you have gotten your clocks cleaned by Stanford spinoffs and Harvard jocks. Aren't you ashamed?

MIT graduates and Digital alumni, take an F for the decade. You have either sold out for safe and boring jobs on Wall Street or chosen not to be entrepreneurs. The key to Massachusetts' industry has been people who are smart enough to go to school or work here and not bright enough to leave. MIT graduates and Digital alumni, that's supposed to be you.

Where are Sanborn and Apollo and Chipcom and Cascade? All are local high-tech companies that today are divisions of the West Coast's HP, 3Com and Ascend. Where is Digital? A division, like Tandem, of a Texas company.

So what if the weather is nicer in Silicon Valley or Houston. Adversity is good for your geek soul. You have a higher calling, and we need you here in the frozen Northeast. Fulfill your obligations, build companies here and freeze your butts off with the rest of us.

Our only real asset is Yankee ingenuity, the brainpower of the region. You have trifled with the galactic order and breached your implicit contracts with MIT and Digital. Now go make it right.

I hope we won't have to have this little discussion again.

Anderson is founder and president of The Yankee Group, a Boston-based consultancy. He tries to keep his skepticism from degenerating into rampant cynicism, a battle he appears to be losing. He can be reached at handerson@yankeegroup.com.

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elping people get on the
iternet. They simply double
ick in Internet Explorer, type
ı a few numbers and they are
ı their way.

Even if I have a new user
no has Netscape or wishes to
e it, it is still far easier to make
ie Internet connection by
ı st setting up Internet
xplorer, then installing or
ing Netscape.
ark Skjerve
stem administrator
anther Creek
formation Services
ringfield, Mo.

The antitrust discussion
inges on choice: Is Microsoft
eventing users from choos-
g a browser? No. If users
on't want to spend the time to
ıstall another browser, whose
ult is that? Microsoft has a
ght to add whatever feature/
inctionality it wants, without
vernment interference.
Elliott Whitlow
Des Moines, Iowa

I agree that Microsoft offers consistently more bang for the buck when it comes to operating system and application software. However, I disagree with Microsoft's practice of forcing systems vendors to load Internet Explorer and its associated system functionality or be refused the right to sell the Microsoft OS.

I don't want to be forced to accept products I don't require simply because they're bundled. Hopefully, we'll soon see some regulation—something to which I am generally averse—that prevents consumers from being forced to accept add-on products just to get the single one they want.
Wayne Jones
IS manager
Network InfoServe, Inc.
Tampa, Fla.

Microsoft forces PC manufacturers to use its OS and applications through its rigid but legal licensing agreements. Couple this with its predatory practice of buying or re-creating every competing product and you have a situation that stifles competition and innovation to the detriment of users.

Microsoft's products in some cases cannot do the work I need to do, forcing me to purchase additional software that Microsoft then tries its damnedest to break. So when the Justice Department slaps Microsoft's wrist for a clear violation of the consent decree that stipulated that Microsoft not require IE as a precondition for Windows 95 licenses, I'm not too upset.
Paul Ames
Bellport, N.Y.

Get more online:
More reader views on Microsoft vs. the Justice Department.
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Outlaws on the loose

Continued from page 1

All the while, the problem is getting worse. Whereas at one time most intruders were just curious youngsters in it for the thrill of the chase, an increasing number of intruders are engaged in industrial espionage for competitors and foreign governments. Because wealth is largely digital these days, computers are prime targets.

According to a recent study by WarRoom Research, a security consulting firm in Baltimore, in 1997 hackers successfully penetrated all of the surveyed Fortune 1000 companies. A whopping 56% of those companies said their systems were attacked 31 to 40 times (see graphic). Law enforcement officials say industrial espionage accounts for much of the increase.

"Working undercover, I see a shift from the joy-ride hackers to the criminal hackers because there is money to be made," says Michael Menz, a Sacramento County detective and president of the Northern California chapter of the High Tech Crime Investigators Association (HTCIA). For example, hackers in St. Petersburg, Russia, were caught stealing some $12 billion from Citibank Corp.'s mainframes in New York.

To stem computer crimes, a couple of simple steps need to be taken. First, law enforcement agencies need to start maintaining statistics on security breaches in order to make a case that more resources are needed to combat them. And corporations need to come forward to report attacks and work with law enforcement to nab intruders.

A decade of blunders

Computer crime reared its head with the advent of time-sharing in the 1960s and 1970s, when networked terminals provided new points of access. Attempts to apply existing laws to cyberspace proved unsuccessful, however.

"Legal systems are based on the physical universe," says Winn Schwartau, chief operating officer at The Security Experts, Inc., a global security consulting firm, in Seminole, Fla. "The concept of possession means something very distinct in the physical world. There are fundamental differences in cyberspace, where assets can be in more than one place at the same time."

Congress started to address computer crimes as a special category in the mid-1980s and passed the Computer Fraud and Abuse Act (Title 18, Section 1030) in 1986.

But companies that reported computer crimes had trouble getting law enforcement officials to take an interest. Agencies passed the jurisdictional buck around, and victims had trouble quantifying damages.

In 1988, a 75-cent accounting shortfall alerted astrophysicist-turned-systems-administrator Clifford Stoll to the presence of a cracker who was using his Lawrence Berkeley Lab network as a jumping-off point for illicit excursions through one of the nation's military networks. The FBI wasn't interested because the lab couldn't demonstrate financial losses of at least $1 million.

Stoll didn't want the intruder to get away with this breach of the Internet community's trust and pursued the investigation at his employer's expense. Ten months and more than $100,000 later, Stoll's efforts (which he recounts in the book *The Cuckoo's Egg*) resulted in the exposure of a Soviet spy ring operating in West Germany.

"As we learned from that case, something that looks little might turn out to be very big, and vice versa," says Martha Stansell-Gamm, one of the principal attorneys in the Department of Justice's Computer Crime and Intellectual Property Section (CCIPS), in Washington, D.C. "There is no way to tell if an intruder is an international spy or a teenager collecting trophies."

Law enforcement agencies blundered into the 1990s with a concerted crackdown that targeted bulletin boards allegedly functioning as hacker hangouts. But the first bulletin board system (BBS) seizure by federal agents — in Austin, Texas, on March 1, 1990 — was a mistake. The BBS actually was operated as a customer service by a legitimate business called Steve Jackson Games, which later sued the government and was awarded $51,000 in damages.

Steve Jackson Games was still trying to get its computer equipment back on May 8, 1990, when 150 Secret Service agents, backed by local law enforcement agencies, executed 28 search warrants in 13 cities around the country. Dubbed Operation Sundevil, the carefully planned strike "was dramatic and fear-inspiring at the inception but ended up a fiasco by most accounts," says Lance Rose, a Montclair, N.J.-based attorney who specializes in online law and author of *Netlaw: Your Rights in the Online World.*

Operation Sundevil netted some 42 computers, 25 BBSes and 23,000 floppy disks but resulted in only four arrests, and one was on an illegal-weapons charge. Most of the people whose property was seized were never charged with any crime, which raised the hackles of civil libertarians focusing on cyberspace issues. They banded together and formed the Electronic Frontier Foundation (EFF), now a major lobbying force for electronic civil liberties.

Congress tried to clear up some of the legal

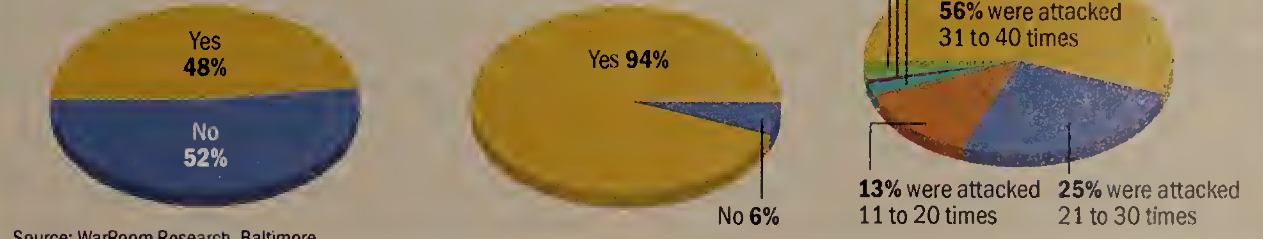
CYBERCRIME'S BITE IS GETTING FERAL

Most of the Fortune 1000 companies surveyed by WarRoom Research said they were stung by security breaches in 1997.

Directed attacks
Nearly half of the respondents suffered from directed attacks in which the hacker clearly had inside information about how to get to data. And this only reflects the attacks the companies detected.

Warning workers
When asked if they posted warning banners on their networks to inform employees that their corporate computer systems are subject to monitoring at all times, the majority of companies said yes.

Successful attacks
Hackers were good for repeat business at all of the companies that were successfully attacked in 1997.



Source: WarRoom Research, Baltimore

confusion by making adjustments to the Computer Fraud and Abuse Act in 1994, but the changes had some unexpected consequences that actually made things worse.

While attempting to broaden the statute, lawmakers inadvertently removed federal protection from certain government and financial-institution computers, decriminalized hacking activities and inappropriately criminalized certain insider conduct. Before they would prosecute, lawmakers also required that break-ins resulted in "damage" without clearly defining the term.

According to a 1996 report to Congress by the U.S. Sentencing Commission (USSC), only 174 computer criminals were convicted under the statute during its first decade on the books. The USSC compared these individuals to other federal defendants and found that computer criminals were much better educated and typically had no criminal history.

Sentencing statistics were mixed. On the one hand, computer criminals received enhanced sentences for "abuse of position" much more frequently than other white-collar defendants. On the other hand, sentences imposed on computer criminals were generally light; the courts never imposed penalties stricter than sentencing guidelines recommended.

The USSC study also found that the convicted computer criminals had "only a pedestrian level" of computer expertise and tended to be insiders who had authorized access to portions of the computer systems they penetrated. Until 1996, at least, the typical computer crime defendant was not a highly skilled computer hacker conducting raids from the far reaches of cyberspace.

Following the USSC report, legislators overhauled the Computer Fraud and Abuse Act and renamed it the National Information Infrastructure Protection Act of 1996. Signed into law in October 1996, the statute covers any computer connected to the Internet or telephone network.

The changing letter of the law

1986 — Computer Fraud and Abuse Act (Title 18, Section 1030) This law made it a felony to access a computer without authorization, but it failed to address security breaches caused by authorized users.

1994 — Computer Fraud and Abuse Act The 1994 adjustments to the 1986 law placed more emphasis on the hacker's intent. The changes made it a felony for trespassers or authorized users to intentionally cause damage. However, anyone who caused reckless damage — whether it be a trespasser or an authorized user — was merely charged with a misdemeanor. Unfortunately, the revised law failed to address accidental damage and inappropriately decriminalized some hacking activity.

1986 1994 1996

1996 — National Information Infrastructure Protection Act of 1996 The latest revision of the Computer Fraud and Abuse Act concentrates on the hacker's authority to access the computer and criminal intent to do damage. The law makes it a felony for anyone to access protected computers without authority, but users who have authority to access the systems are criminally liable only if they intended to cause damage.

Lawmakers eased, and in some cases eliminated, the requirement that victims must demonstrate a certain level of monetary loss. In fact, they made the very act of unauthorized access to information a crime. Computer intruders now are breaking the law just by reading the information online — they don't even have to download a copy.

The law also includes a careful distinction between public and private computers. Consequently, visitors can't construe the presence of a Web server on a private network as an invitation to prowl around in other areas of that network. A section of the law also addresses threats against computers, networks, programs and data.

In other changes to the statute, legislators broadened the definition of damage and eased the definition of recidivism. A criminal no longer needs to break the same part of the law twice to qualify as a repeat offender subject to stiffer penalties.

Quantifying the problem

Just how prevalent network intrusions are is a matter of conjecture. EFF members say government agencies are exaggerating the problem considerably to justify greater funding and an expansion of their powers. The EFF points out that there are no statistics showing that computer crime is increasing relative to the growth of the Internet and the number of people using it.

"You can't get the citizens of the United States to let you rip up the Bill of Rights without the specter of absolute doom," says Giles McNamee, senior vice president of technology research for investment banker First Albany, in Boston. "And with no facts to substantiate anybody's case, you can build as big a picture of doom as you want."

> *"I see a shift from the joy-ride hackers to the criminal hackers because there is money to be made."*
>
> **Michael Menz,**
> Sacramento County detective

The FBI still does not include computer crime as a category in its annual crime-statistics report. One problem is that many cases are resolved when perpetrators who have been charged with several crimes plead guilty to just one of them.

Because computer crime is still a new and rather uncertain area that lacks a big body of case law, it is the computer-related charges that tend to get dropped during the plea-bargaining process.

The lack of solid statistics is a sore point with some local law enforcement officials. "When you ask for the budget to equip and train special computer crime units, people say computer crime is not that much of an issue," says Gail Thackeray, a deputy county attorney for Maricopa County in Phoenix. "And you can't prove that it is because there aren't any statistics.

"If the FBI can track gang-related crime, they should be able to do the same for computer-related crime," she says.

Meanwhile, "nobody has a good empirical measure of the nature and scope of computer crime," Justice Department attorney Stansell-Gamm says. People have to rely instead on numbers derived from studies by industry groups in the private sector.

The Computer Security Institute's (CSI) 1997 Computer Crime and Security Survey of U.S. corporations, government agencies and universities found that 47% of the respondents had suffered at least one attack from the outside in the previous 12 months. Security breaches cost the 249 organizations that had been attacked more than $100 million, or an average of $400,000 each.

Experts are quick to point out that these numbers are quite conservative because they represent only the attacks the victims noticed.

The Defense Information Systems Agency's Automated Systems Security Incident Support Team has performed penetration testing in which standard hacking techniques were used to attack systems in the Defense Information Infrastructure community. In the most recent test, 88% of the attacks were successful. Systems administrators only noticed 5% of these penetrations and subsequently reported only 5% of the detected incidents.

"So for every reported incident, there are something like 400 intrusions that go undetected," Stansell-Gamm says. Experts use the results of this controlled study to estimate the levels of nondetection and underreporting on corporate networks.

The cost of silence

Law enforcement efforts are stymied because victims generally don't report network and computer intrusions. Companies don't want customers, investors and competitors to know when security has been breached, so many of them have steadfastly remained silent about cracker attacks.

"The problem is corporate cowardice," says Thom Stark, president of Stark Realities, a network consultancy, in El Cerrito, Calif. "Is it stupid and counterproductive? Of course it is. Why do you think *Dilbert* is so popular?"

In the CSI study, less than 18% of the intrusions the victims noticed were reported to the authorities. Two-thirds of the companies that decided not to report incidents said fear of bad publicity kept them from coming forward.

Companies also are concerned about the cost and inconvenience of cooperating with law enforcement investigations and legal proceedings.

"If you're a medium-size company, they can drown you in discovery," says Robert Gezelter, a security consultant in Flushing, N.Y., who has served as an expert witness in computer crime cases. "That has a chilling effect. It's not like a conventional crime where police come in and bag the evidence and that's the last you hear about it until the trial."

The situation is frustrating for police and prosecutors. "We have victims who weren't very bright about securing their systems in the first place, and then they don't want to cooperate with law enforcement when there is a break-in," Thackeray says.

Law enforcement officials insist they are more sensitive to cost issues these days and don't expect to be able to freeze up network systems for weeks on end while they investigate. It is heart surgery, not car repair, and it has to be done while the patient is breathing.

Reporting must pick up if law enforcement agencies are going to expand their computer-crime-fighting capabilities. The agencies already have their hands full with the cases being reported, but they need a backlog.

"Without this excess demand, it will be very difficult for us to get the resources we need," says Jim Christy, an Air Force special agent and the Department of Defense representative on the Infrastructure Protection Task Force, in Washington, D.C. "We are always going to be one step behind the bad guys, and we can't catch all of them. But if we hear about them, we will at least find out what they did and learn about their tradecraft, and that can help us to take appropriate countermeasures."

Go online for more information about the scope and nature of computer crime, as well as a copy of the National Information Infrastructure Protection Act of 1996 and a legislative analysis of it.

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Law enforcement improves

Tsutomu Shimomura's bestseller *Take-Down*, which recounts the pursuit and capture of computer outlaw Kevin Mitnick three years ago, paints a pretty sorry picture of law enforcement. However, three years is an ice age in cyberspace, and experts say big strides have been made since then.

"We're a lot better than we used to be, even three years ago," Stansell-Gamm says. "You might be surprised at the quality of our investigators and ready-assistance prosecutors, and at the networks we've built internationally."

A federal training center in Georgia started offering computer-crime training in the early '90s. Since then, thousands of federal and local law enforcement officers have gone through the two-week course.

Each of the country's 94 federal judicial districts now has a designated computer and telecommunications coordinator. These specialized prosecutors get additional training at least once a year.

"The change is somewhat erratic across various jurisdictions, but there are cells of police in different areas that are getting more and more involved," says Abigail Abraham, an assistant state attorney in the Cook County State's Attorney's Office, in Chicago. Also, the young recruits out of high school and college these days have had more exposure to computers."

A number of states — including California, Florida, Georgia, Illinois and New York — have been focusing extensive efforts on combating computer crime. Some have been giving the feds a lesson or two.

By 1993, New York had two trained computer-crime investigators in each of the state police's 10 troops. And in 1996, Nassau and Suffolk counties and New York City launched their own computer crime units.

"More than 90% of the complaints we receive result in arrests," says Don Delaney, a senior investigator and veteran computer crime specialist in the New York State Police's major case squad, in Farmingdale, N.Y. "And there's no minimum damage amount that victims have to demonstrate."

In 1995, four counties in the Sacramento, Calif., area assembled a high-tech crimes task force that is now viewed as the national model and is feared by criminals. "Hackers tell each other, 'Don't mess around in Sacramento because they've got computer cops,'" Sacramento County Detective Menz says.

Well-trained investigators are the key, and the task force put more than 1,000 officers through special courses in 1997. The California State Assembly's Public Safety Committee is looking to expand these efforts in 1998 through legislation that would make computer law enforcement training mandatory for all officers who have field or investigative duties — a step other states should consider.

Fixing the problem

Any effort to keep cyberspace safe for business must start with the victims. Delaney says most of the cases the New York State Police have investigated could have been prevented with good security practices. (For more information, see *Network World's* special section on securing the Web, Feb. 2, page 35.)

When the best security is breached from time to time, be ready to respond by preserving evidence and contacting the right authorities immediately.

"Make it a point to find out who handles computer crime in the local white-collar crime unit — police or FBI or whatever — and get to know them," advises Jim Patterson, vice president of security and telecommunications at Oppenheimer Funds, in Denver. He suggests that network administrators familiarize themselves with computer crime laws and rules of evidence so they know what kinds of records to keep.

Law enforcement agencies need to foster relationships with businesses through outreach efforts. For example, local chapters of the HTCIA provide a forum for law enforcement officials to meet regularly with local businesses. This can foster a sense of community that makes companies more likely to come forward when they are victimized.

> ***"You can't get the citizens of the United States to let you rip up the Bill of Rights without the specter of absolute doom."***
>
> **Giles McNamee,**
> Senior vice president of technology research
> First Albany

Jurisdictional complexities have been the computer criminal's best friend, and they need to be addressed by some type of centralization. Investigative jurisdiction has always been based on geography, which is the wrong paradigm for cyberspace. Hackers hop across multiple jurisdictions in seconds as they commit their crimes.

"It's a procedural problem," Thackeray says. "Can I get subpoenas honored by 43 different carriers in different jurisdictions fast enough to do some good?"

Suggestions for centralization include a national task force that incorporates state and local jurisdictions and serves as a mechanism for sending cases to one particular court. "Maybe we need a new type of cyber court," special agent Christy says.

Centralization would provide some consistency of crime categorization and case management in this emerging area of the law and help law enforcement agencies share information in a more systematic way. These are prerequisites to coming up with better computer-crime statistics — something law enforcement desperately needs to do.

Pooling resources also would help agencies make better use of the few prosecutors who are computer savvy.

"There aren't a lot of lawyers out there who are part computer scientist and part prosecutor, and the few who exist can make a lot more money outside of government," says Andrew Grosso, a former U.S. attorney who has master's degrees in computer science and physics. Grosso is now in private practice in Washington, D.C.

Centralization also could help law enforcement to choose the right cases to prosecute.

Even a little bit of prosecution might have a big deterrent effect if it's applied carefully, says Eugene Volokh, a professor at UCLA Law School. "We're dealing with people who are not professional criminals, and they may be scared off by the possibility of arrest and incarceration. They aren't like professional criminals who factor these things in as part of the cost of doing business," he says.

The next generation

Last but not least, parents, teachers and industry leaders need to do a much better job educating children about the proper use of computers.

"The adult world is unanimous in its condemnation of certain things, like stealing physical objects and peeping in windows," Stansell-Gamm says. "Before we give kids the keys to the car, we make sure they understand that society expects them to respect some limits or suffer the consequences and lose the privilege. In the computer world, teachers aren't teaching these ethical limits because they don't know they have to."

Technology leaders need to speak out, too, because what they say resonates with the types of kids who become hackers. These youths will listen to a Bill Gates or Mitch Kapor in ways they will never listen to parents, teachers and law enforcement officials.

If kids are reached early enough, the effort can probably prevent crime and subsequent law enforcement later on.

"In the long run, the best overall defense is to reduce the number of individuals who are so alienated from the social fabric that they engage in such destructive or otherwise illegal acts," says David Johnson, legal counsel for the EFF, in Washington, D.C.

Breidenbach is a consultant and freelance writer in San Mateo, Calif. She can be reached at sbreidebach @usa.net.

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Q&A

MIT'S MICHAEL DERTOUZOS ON INTERNET COMMERCE AND HOW TO BEAT MICROSOFT.

Getting down to business

As director of the Laboratory of Computer Science at Massachusetts Institute of Technology, Michael Dertouzos is called upon to advise CEOs and politicians on information technology. He has been one of the players at the forefront, orchestrating the growth of the Internet and the World Wide Web.

He also is an outspoken futurist and author of the recent book *What Will Be: How the New World of Information Will Change Our Lives* (HarperEdge, 1997). The tome details Dertouzos' vision of how what he calls the "Information Marketplace" will expand into an elaborate utility in our lives and how we'll communicate with each other through innovative devices. The book elaborates on developments such as medical kiosks that will enable people in outlying areas to be diagnosed by remote doctors. And it tells of "bodynet" technology, which involves personal electronics that enable data to be passed wirelessly between people, all triggered by a handshake.

In a recent conversation with *Network World* Senior Editor Andy Eddy, Dertouzos offered his perspectives on the continued growth of the Internet, the vulnerability of Microsoft Corp., the government's role in the technology business, the conflict between "techies" (technologists) and "humies" (humanists) and most importantly, where it's all leading us.

As we head into the new millennium, what impact do you see the Internet having on the way we do business?

By the turn of the century, we'll be upwards of $10 billion [in transactions per year], and that's conservative. In 1996, it was a couple of hundred million by my count. In 1997 we were over $1.5 billion — and people tell me I missed things, so it was probably more than that.

I'll go further and say in the early part of the 21st century, somewhere around 2025, we'll be at around $3 trillion. The value of work performed by white-collar workers — doctors, accountants, brokers, those kinds of people — is $9 trillion today. That's 60% of our economy. All that could go on the Internet, but it won't. I'm saying a quarter to a third of that, maybe $2 trillion to $3 trillion, will go on the Internet as it matures and changes in the early part of the 21st century.

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Go online for an expanded version of this interview.

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How about electronic commerce?

It's very hard to make distinctions. If you have 5,000 accountants in China, and they're selling their accounting work to General Motors for $1 an hour, is this electronic commerce? To me, it is two kinds of things:

- Indirect commerce means you do on the Internet all the advertising, the transacting, the closing, the contracting for stuff that's transported by the mail or by trucks. It's indirect because you do everything on the Internet, but then the stuff has to come to you by a truck.
- Direct electronic commerce is where everything happens on the Internet. You do the transactions and then you get back what you bought, which may be photographs, software, a manual or a book that's printed in your home.

The biggest chunk of this is indirect commerce, of course, and it's happening already. Look at Michael Dell and look at amazon.com.

I call this whole world the Information Marketplace. People buy, people sell and people freely exchange information and information services.

That brings up security issues, which are going to expand as the Internet expands.

It's not a technological limitation that's keeping us from security. It is more reaching agreements about the security standards we want to use. I see that evolving slowly; I think it's going to take three or four years before it reaches maturity.

If we were all to adopt a two-key system — the private/public key system, which is the queen of all the technologies in my opinion — then the problem is solved. We could do that tomorrow morning if we agreed. [But] humans don't like to agree, because they each have different approaches they want to follow, or none at all.

Speaking of people who don't agree, what are your thoughts on Microsoft vs. Netscape Communications Corp. — or even potentially Microsoft vs. the industry.

Most people don't understand what's going on. Microsoft is vulnerable.

There's a guy working here [at MIT] who produced a piece of software that has reached more people than Windows 95. His name is Tim Berners-Lee. He invented the World Wide Web. He beat Microsoft in the number of units sold, so to speak. Now, if one guy alone can invent something that outsells Windows, what could another guy like him do with the backing of a company?

STELLA JOHNSON

MIT's Michael Dertouzos *expects that by the year 2025 some $3 trillion in transactions will be taking place over the 'Net annually.*

[The problem is] the absence of good ideas. I don't see them. If people came up with good ideas and built them up, made them useful, offered true utility to people, then they could very easily compete with Microsoft.

But Microsoft's modus operandi to date has been, in some cases, to take what people have done well and make it a Microsoft concept.

Didn't Netscape do exactly the same thing? It took Mosaic. And didn't the people [who developed] Mosaic basically lift the work of Berners-Lee? And didn't Apple [Computer, Inc.] steal the work of Xerox [Corp.] when it built the Macintosh? And then [laughing] didn't the Windows system basically steal from Apple?

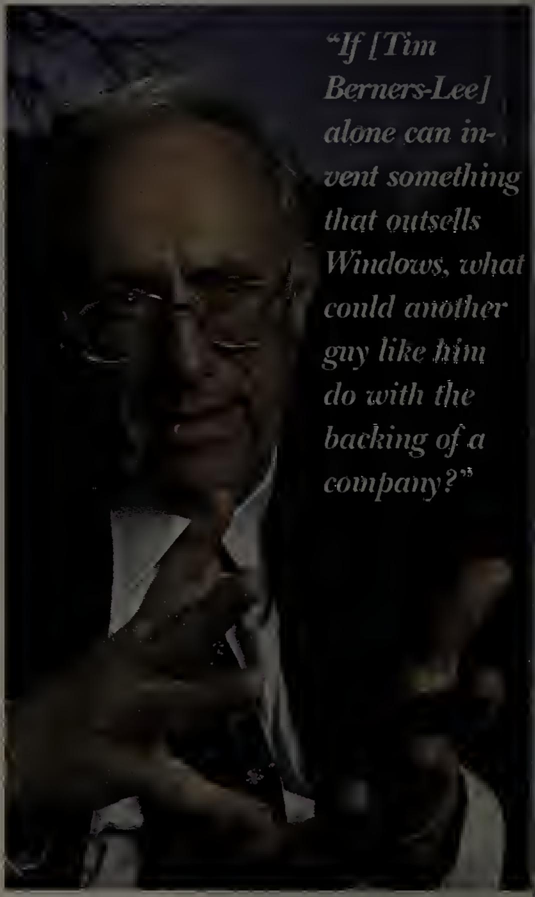
These points of taking from one another — what the Japanese call "You great teacher, I learn from you" — this is part of our business. And if it's done within the framework of the law, it's the way that the field moves forward. Good ideas are copied. I don't understand why people are crying foul about that.

[Ed: Bill Gates, the chairman and CEO of Microsoft, wrote the foreword for Dertouzos' What Will Be: How the New World of Information Will Change Our Lives.]

Is it still the case that there's a split between techies and humies, or do you see a blending as the Internet becomes more mainstream?

Oh, no. It's the case still, and it will be the case probably for another 100 years, until we mend our ways [laughing]. I'm looking at some very big trends here — trends that started 300 years ago. The people you know, aren't they either good with words or good with machines? We kind of believe that we have to have this dichotomy, and we can't cope in the world of tomorrow with this dichotomy because the world doesn't divide nicely into technology on the one hand and humanity on the other. It's a blend of everything, and we have to have that blend within us.

I think your readers have to have that blend, they have to understand what networks can do technologically, and they have to understand what kind of uses networks are good for humanistically. What do you do with them as a human being? Increasingly, you're going to see more and more of that if we are to cope with this complex world. Yes, it's a very important thing for us to unite the techie and humie within us, and to know it's not happening very fast.

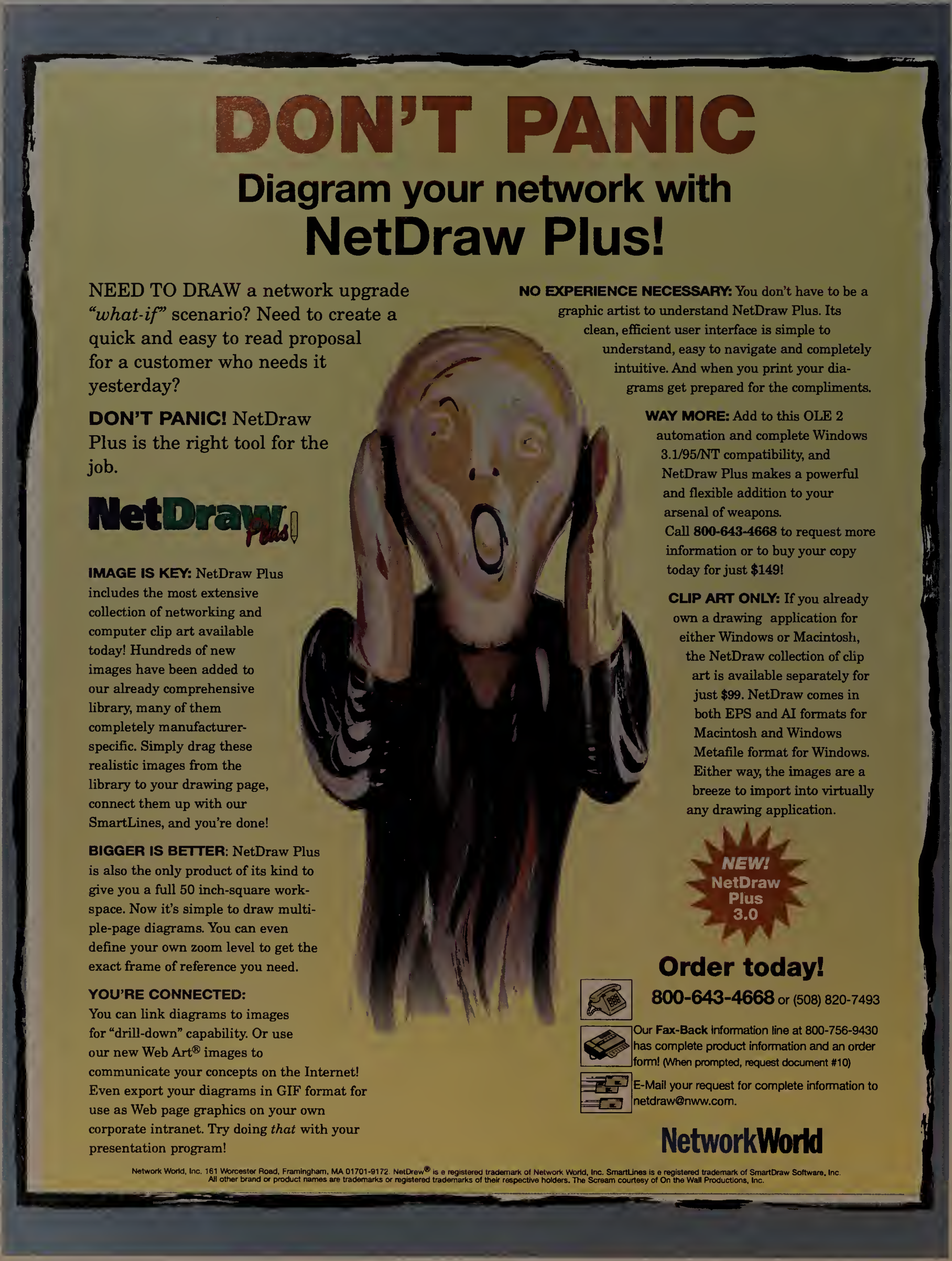


"If [Tim Berners-Lee] alone can invent something that outsells Windows, what could another guy like him do with the backing of a company?"

What's the biggest hurdle for us to get over?

The Internet and the Web today are in the fairly early stages of their development: You take and you open a picture a thousand miles away or down the corridor. That's way short of what the Information Marketplace will be like — we'll be people buying and selling and freely exchanging work. We won't just be clicking and looking at pictures on the other side.

How does a person or a company sell their work over this medium, and how do they sell their products? How does a doctor cure someone at a distance? How do we get the accountants from China to sell their work to General Motors? You don't just click and look at pictures [laughing]. We've got to improve technically what the network does in the future to make these things possible. ■



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REVIEW

BINDVIEW EMS 5.1 NOT ONLY REPORTS ON YOUR SERVERS, IT NOW MAKES IT EASY TO CHANGE SETTINGS AND ENFORCE POLICIES.

Old reliable breaks new ground

By Blaine Homer

BindView Development Corp. has long been known as a premier developer of network management reporting tools. But until now, BindView has lacked a way to fix the problems its reporting tools discovered. The newest BindView EMS/NOSadmin, Version 5.1, changes all that; not only can you create reports on network information, you now can let the software remedy the problems that turn up in the reports.

BindView EMS is a useful tool for any administrator's toolbox, especially in large environments in which changes in Novell Directory Services (NDS) information need to be made simultaneously to multiple accounts. However, we found the NOSadmin software for NetWare to be much stronger than its NT counterpart; many of the features available for NetWare are not yet available for NT. That shortcoming left BindView EMS just shy of earning a second World Class Award (*NW,* Dec. 16, 1996, page 40). This time the bar has been raised — the newer version attempts to do more than the previous version and doesn't succeed quite as well.

Score Card

BindView EMS 5.1

Administration (15%)	9 x .15 = 1.35
Stability (15%)	9 x .15 = 1.35
Reporting (15%)	9 x .15 = 1.35
Accuracy (20%)	10 x .20 = 2.00
Configuration (10%)	8 x .10 = 0.80
Ease of use (10%)	7 x .10 = 0.70
Installation (10%)	9 x .10 = 0.90
Documentation (5%)	9 x .05 = 0.45
Total score	8.9

Individual category scores are based on a scale of 1–10. **Percentages** are the weight given each category in determining the **total score.**

Net Results

BindView EMS 5.1

BindView Development Corp.
(800) 749-8439; (713) 881-9100
www.bindview.com

PROS

- ▲ Easily makes multiple changes to NDS records
- ▲ Great reporting and site standardization tool for NT and NetWare

CONS

- ▼ Can't push NLMs or Set parameters to servers
- ▼ No Active Admin features for NT

$695 per EMS console; $495 per Windows NT or NetWare 4 server; $795 per NetWare 3 server; $1,495 per 100 users

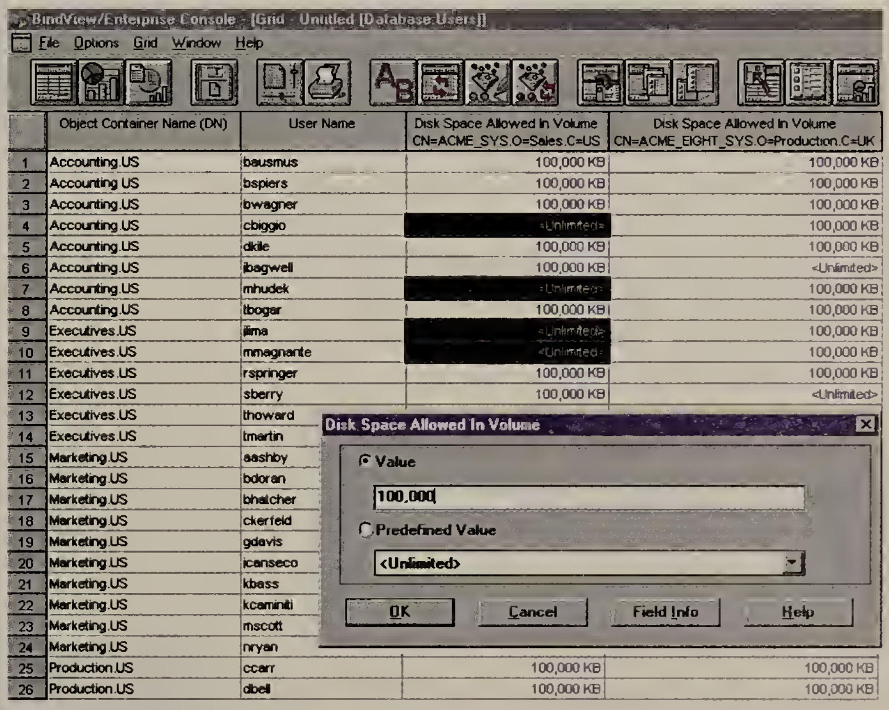
Help is finally here

The NOSadmin module contains two excellent new features: Active Admin and Site Standards. Active Admin gives administrators the ability to verify the implementation of specific company policies as well as find and fix entries that do not comply with them.

To test the feature in a real-world situation, we installed the product at a college lab, which preferred not to be named, that supports more than 3,000 students. The lab has 100 workstations running on a NetWare 4 server. Students have their own accounts, and a large percentage of the accounts turn over every semester.

With EMS 5.1 we were able to run a report listing all the student account and password information — account expiration date, maximum connections, passwords changeable or required, and so on. Presenting the information in a spreadsheet-like format, the report showed that some passwords were required to be at least four characters in length, others five, and still others didn't have a mandatory length.

To rectify problems, you can change the information in the report one cell at a time or by an entire column. For this test, we selected a column and chose to Edit Selected Cell(s). EMS 5.1 opened the password information screen, allowing us to specify a minimum password length of five digits. EMS 5.1 then applied the change to NDS for all the highlighted accounts. To make these changes without EMS 5.1, you'd have to change each student's account with NWAdmin or re-create each account using a single template.


BindView/Enterprise Console - [Grid - Untitled [Database:Users]]
File Options Grid Window Help

	Object Container Name (DN)	User Name	Disk Space Allowed In Volume CN=ACME_SYS.O=Sales.C=US	Disk Space Allowed In Volume CN=ACME_EIGHT_SYS.O=Production.C=UK
1	Accounting.US	bausmus	100,000 KB	100,000 KB
2	Accounting.US	bspiers	100,000 KB	100,000 KB
3	Accounting.US	bwagner	100,000 KB	100,000 KB
4	Accounting.US	cbiggio	<Unlimited>	100,000 KB
5	Accounting.US	dkile	100,000 KB	100,000 KB
6	Accounting.US	jbagwell	100,000 KB	<Unlimited>
7	Accounting.US	mhudek	<Unlimited>	100,000 KB
8	Accounting.US	tbogar	100,000 KB	100,000 KB
9	Executives.US	jlima	<Unlimited>	100,000 KB
10	Executives.US	mmagnante	<Unlimited>	100,000 KB
11	Executives.US	rspringer	100,000 KB	100,000 KB
12	Executives.US	sberry	100,000 KB	<Unlimited>
13	Executives.US	thoward		
14	Executives.US	tmartin		
15	Marketing.US	aashby		
16	Marketing.US	bdoran		
17	Marketing.US	bhatcher		
18	Marketing.US	ckerfeld		
19	Marketing.US	gdavis		
20	Marketing.US	icanseco		
21	Marketing.US	kbass		
22	Marketing.US	kcaminiti		
23	Marketing.US	mscott		
24	Marketing.US	nryan		
25	Production.US	ccarr	100,000 KB	100,000 KB
26	Production.US	dbell	100,000 KB	100,000 KB

Disk Space Allowed In Volume

● Value: 100,000

○ Predefined Value: <Unlimited>

Figure 1: *BindView EMS can create a report showing all users and their disk space restrictions. You then can apply disk restrictions to multiple users at once in a NetWare 4 environment.*

Next, we built a report on disk space usage, then used it to apply restrictions to students' home volumes (see figure). We also built a query to look for files that had not been accessed in the past 90 days, and a query for prohibited graphics files with JPG, GIF and TIF extensions. Once BindView EMS located the files, we could delete them, freeing up almost 2G bytes of disk space.

We were able to apply other policies, including administrator equivalencies, container object access rights and trustee rights to system folders. We were a little disappointed to find we could view, but not change, our server's Set parameters, such as maximum cache buffers and read after write verify. BindView says it plans to include these features in the next release, Version 5.3, which is due out in the second quarter.

Even though EMS 5.1 currently does not let you change the server's Set values, it does let you define Site Standards. This feature lets you create a profile for a desired server configuration. Once a profile is defined, you can run exception reports to verify which servers on your network fail to adhere to the standard configuration.

You can import a profile of a server that is correctly configured for your particular environment or specify one from scratch. Besides Set parameters, you can include NetWare Loadable Modules that should be loaded, version numbers of NLMs and versions of system files. For Windows NT servers you can create a configuration standard that includes a list of device drivers, applied support packs, TCP/IP settings and so on.

When we found exceptions, we wanted to fix the offending server settings. But unlike NetPro Computing, Inc.'s Config Central (*NW*, Jan. 19, page 41), the current version of EMS does not have the ability to push the NLMs to other servers.

The BindView EMS management console can be integrated with Windows 95 or the Windows NT scheduler, which lets you automate report generation. For example, you can schedule disk audits or password-checking reports for every evening or only on weekends.

If you're mostly interested in the product's reporting capabilities, you'll be happy to see that BindView now lets you export reports to Microsoft Office and Adobe Portable Document Format files. We'd like to see HTML added to the list.

Licensing – any suggestions?

BindView EMS in the NetWare environment is an easy install. The program copies files to the server but loads no NLMs. The workstation console pieces loaded on our Windows 95 machine just fine. We later added the NT server and workstation licenses and the NetWare 3 server license. Adding additional licenses was equally simple.

To run EMS 5.1 you need at least one EMS console. You then need to purchase a license for each server. Additionally, for Windows NT and NetWare 4 you also need to purchase the appropriate number of user licenses. (You don't need user licenses for NetWare 3 because all the information in the bindery is server-centric.) Figuring out your total cost is a little confusing, but we can't suggest a better approach.

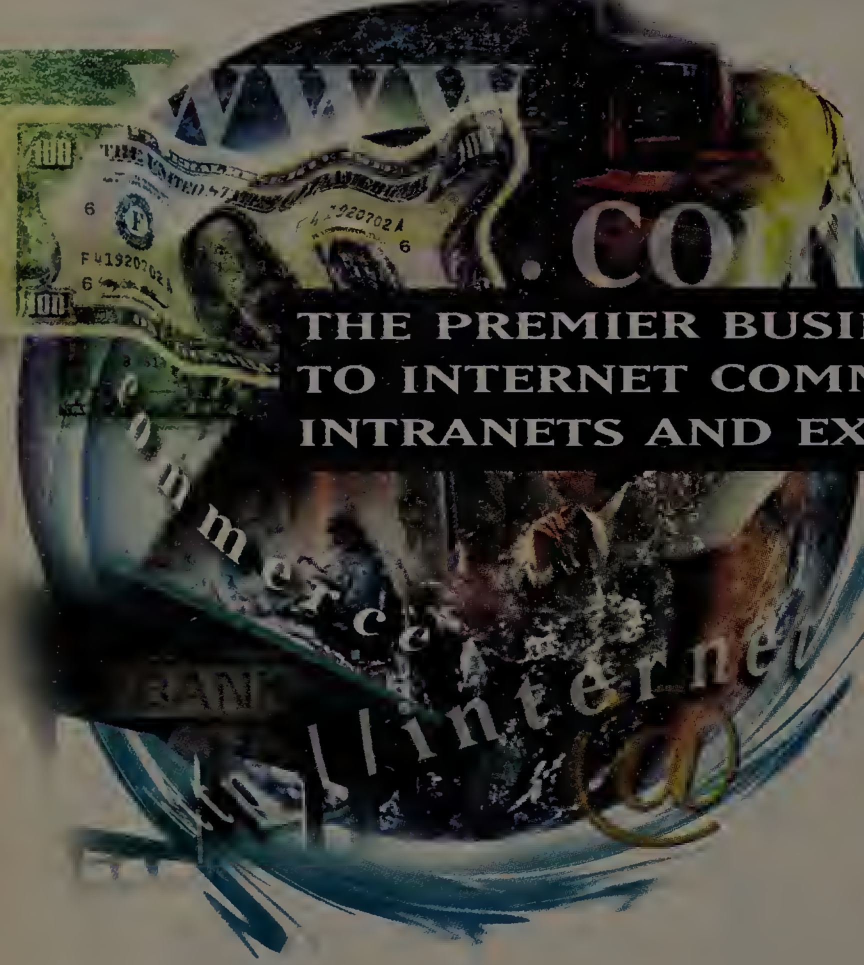
For a number of other perspectives on BindView's products, follow the links on Network World Fusion.
5811
www.nwfusion.com

We were impressed with the amount of information that the BindView product can tell you about your NetWare and NT server configurations. We were especially impressed with the new Active Admin capabilities of NOSadmin for NetWare 4 and its ability to enable network managers to complete tedious tasks in a matter of minutes. However, we look forward to being able to change NetWare server configurations and Active Admin functionality for NT — enhancements promised for a future release.

Homer is the president of Emerging Technologies Consulting. He has written numerous magazine articles and has co-authored several books covering various aspects of the network industry. He can be reached at bhomer@qi3.com.

How We Did It

We installed BindView EMS 5.1 on two networks. We installed the product in a lab with two Windows NT 4.0 servers, two IntranetWare 4.11 servers and one NetWare 3.12 server. We loaded Windows 95 client administration software on a 300-MHz Pentium II workstation. To test the product's utility for large organizations, we took it to a local university and used it in a student lab with 100 workstations that support more than 3,000 users. We ran several of the predefined reports, concentrating on security and disk restrictions.



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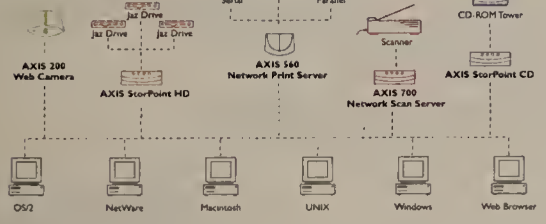

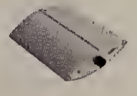

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Introductory report:
Using the Internet as the Corporate Virtual Private Network

Most corporations are familiar with using the Internet for external affairs including employee access and creating a sales and marketing presence on a Web site. Now, corporate network managers are evaluating the potential of using the Internet's flexibility, low cost, security and anytime-anywhere connectivity as a solution for their high-performance private network requirements.

This report evaluates the bandwidth charges and management costs of an Internet-based corporate backbone, as they compare to traditional WAN solutions of private lines and frame relay. The cost analysis is combined with a critique of Internet performance guarantees and information security to provide a full scenario of how different workloads can be supported over such a network. Leading ISPs offering corporate intranets and VPN solutions are profiled according to the services, terms and conditions they provide, and their technology platforms. Finally it portrays real-world companies who have adopted the Internet as their corporate backbone.

To address these issues, Network World has assembled a team of IDC's most senior analysts in the areas of Internet technologies and services. The study is designed to assist buyers in better understanding how, where and when to use Internet services and technologies to support enterprise networking strategies.

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Management Strategies

Tapping into training

Employers that want to recruit top IT talent need to sweeten the deal by offering to pay for network courses and college tuition.

By Evanthia V. Brickates

When Tom Roy was looking for a new job, one of his goals was to find an employer that was willing to foot the bill for Windows NT certification. Roy had just earned a network administration certificate and wanted to build up his NT skills.

The technical support specialist landed at Boston Consulting Group, a management consulting firm that was more than willing to comply with his wishes by allowing him to take an array of courses.

Like Roy, network professionals can afford to be choosy about prospective employers. Companies that want to lure coveted IT personnel increasingly need to sweeten the deal with generous offers of employee training and tuition reimbursement.

Planning for the future

IT job hunters are looking for training that will ensure long-term job security in a constantly changing marketplace, according to technical recruiters. Although NetWare certification was hot a few years ago, Windows NT is the meal ticket of the moment.

Training incentives are especially popular in the Northeast, a region where many IT workers still have nightmares about the depression that gripped the area's high-tech industry in the late '80s, says Eileen Foley, a partner at Winter, Wyman and Company, Inc., a technical recruiter in Waltham, Mass.

Companies unwilling to provide such training will find themselves behind the eight ball in terms of recruitment, she adds.

Astute older programmers who specialize in COBOL are increasingly looking for companies to retrain them, despite the current demand for Year 2000 project contractors.

"Come 2001, the demand for these folks is going to fall off a cliff," says Steve McMann, manager of the Westborough, Mass., office of national technical recruiter Source Services. "There's a trend to retrain them, but that window of opportunity could close soon."

Educational perks are on the rise on the West Coast too. Some companies still suspiciously view employee training as just another way for workers to puff up their resumes for their next job. However, more and more companies view this perk as a way to recruit workers, develop talent and retain their staffs.

The staff at GTE Internetworking's Network Operations Center bones up on the latest IT technologies through the company's generous training and tuition reimbursement program.

GTE INTERNETWORKING'S TOP TRAINING PICKS

- **ATM**
- **Border Gateway Protocol**
- **Cisco routers**
- **Frame relay**
- **LAN/WAN interfaces**
- **Open Shortest Path First protocol**
- **Synchronous Optical Networks (SONET)**
- **T-1 and T-3 troubleshooting**

"If that is what it takes to get a candidate in the door, they'll do it," says Source Services' Eric Percy, a recruiter at the firm's Waltham, Mass., office. "For network people, being Microsoft-certified is a big deal. If a company is willing to pick up the tab for it, [employees] will be more inclined to stay."

Because of their sophisticated IT needs, financial firms and consultancies appear to be the most eager to cut education deals with prospective employees, according to recruiters. These companies also see such perks as a way to beat out trendier companies for qualified candidates.

"Most people don't want to hang around and be wire pullers," says Gavan Taylor, chief information officer for Boston-based Putnam Investments, which employs about 500 IT professionals. "Because of that, we have established career paths for people to go from technicians to developers."

In addition to tuition reimbursement, Taylor says Putnam readily provides training seminars on ATM and router technologies through major vendors such as Cisco Systems, Inc. and Bay Networks, Inc. Windows NT, Oracle databases, Internet tools and languages are other popular subjects.

"We're in a competitive workplace," says Peter Tedeschi, Putnam's new vice president of network operations. "You need to make sure that your people have all the newest equipment, technology and training." Tedeschi plans to take graduate management courses and says the firm's education perks were a significant factor in his decision to take the job.

High-tech vendor companies don't intend to be left out of the hiring game either. Eager to edge out competitors in the chaotic Internet marketplace, GTE Corp.'s Internetworking division (formerly BBN, Inc.), in Cambridge, Mass., also has become a believer in offering training incentives to recruit and retain IT professionals.

Prospective employees are always asking about training, says Joe Leonard, director of network operations for GTE Internetworking, where a crew of 43 technicians maintains 4,500 routers.

GTE has found training incentives to be so effective that it now offers in-house instruction on such topics as LAN/WAN interfaces, T-1 and T-3 line troubleshooting, the Open Shortest Path First protocol, Border Gateway Protocol and advanced Cisco routers. The company also provides a $7,500 annual tuition reimbursement.

Most of GTE's system runs on Unix, so Unix administration certification is a popular academic track, along with instruction in frame relay, ATM, Synchronous Optical Networks (SONET) and Cisco routing technology.

Offering top-rate training programs aids employee retention by keeping people interested in their jobs. "Without challenging people on a regular basis, especially your better people, they'd probably leave," Leonard advises.

He proudly points out that only one employee of GTE's networking group has left the company since the fall of 1996, when GTE bought BBN. The man who resigned was moving out of the country.

That kind of low turnover also helps reduce recruitment costs. "The cost of trying to find someone is high," Percy notes. "It may be cheaper for [employers] to train someone from the inside, and it shows goodwill towards employees."

Brickates is a freelance writer based in Boston. She can be reached at vbrick@ix.netcom.com.

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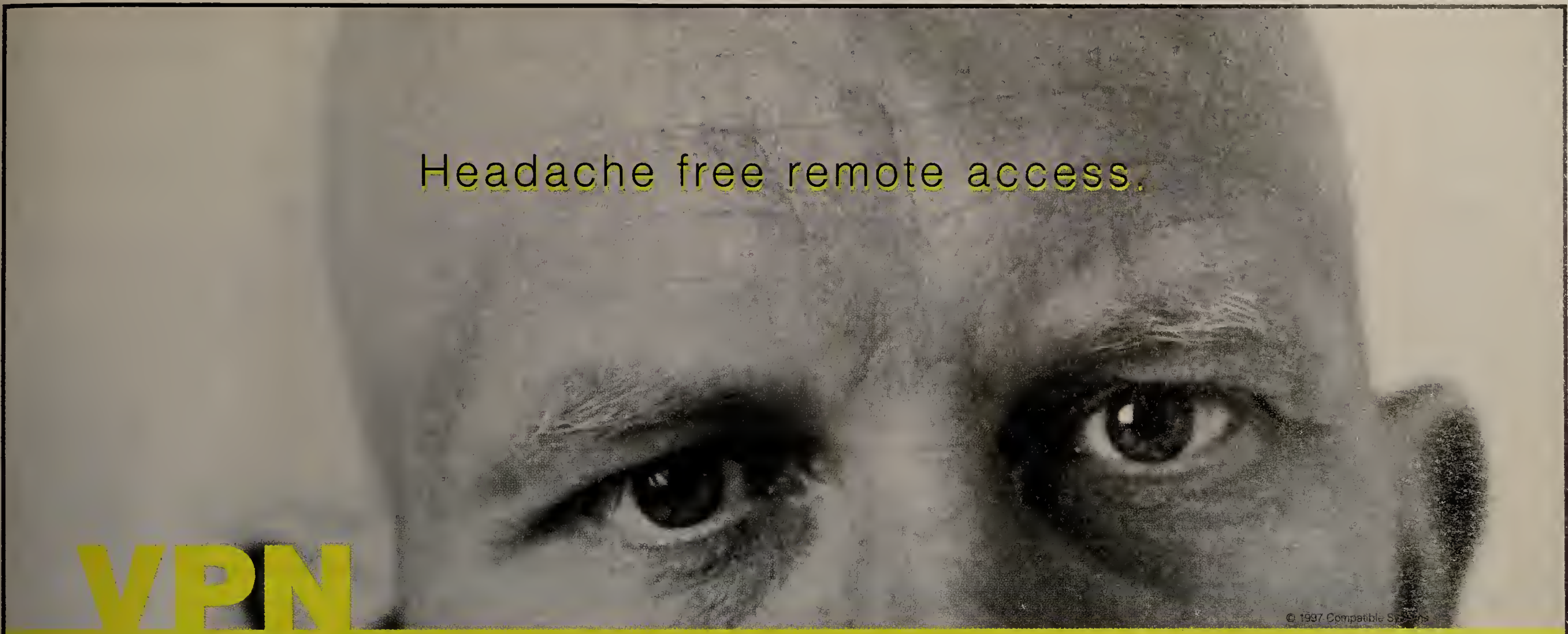

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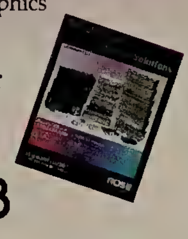

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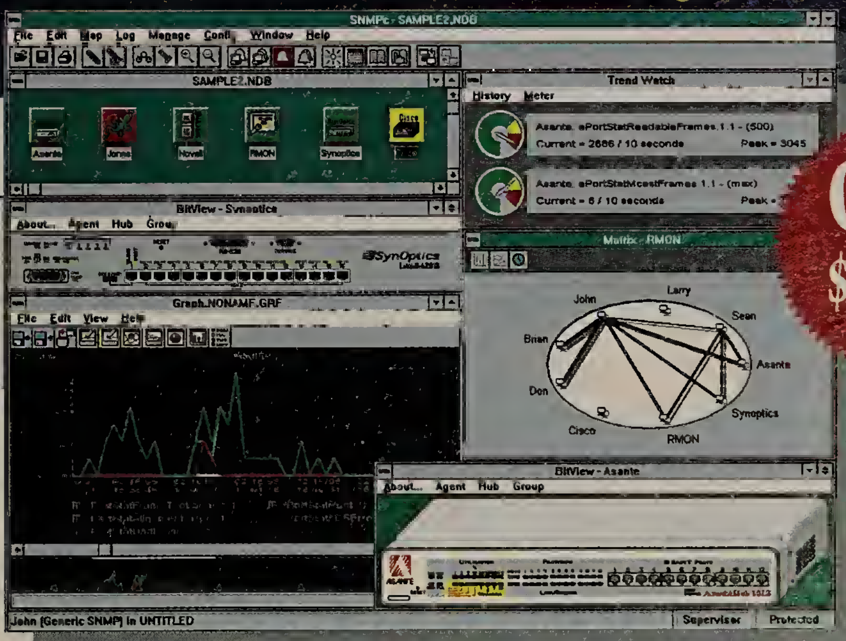

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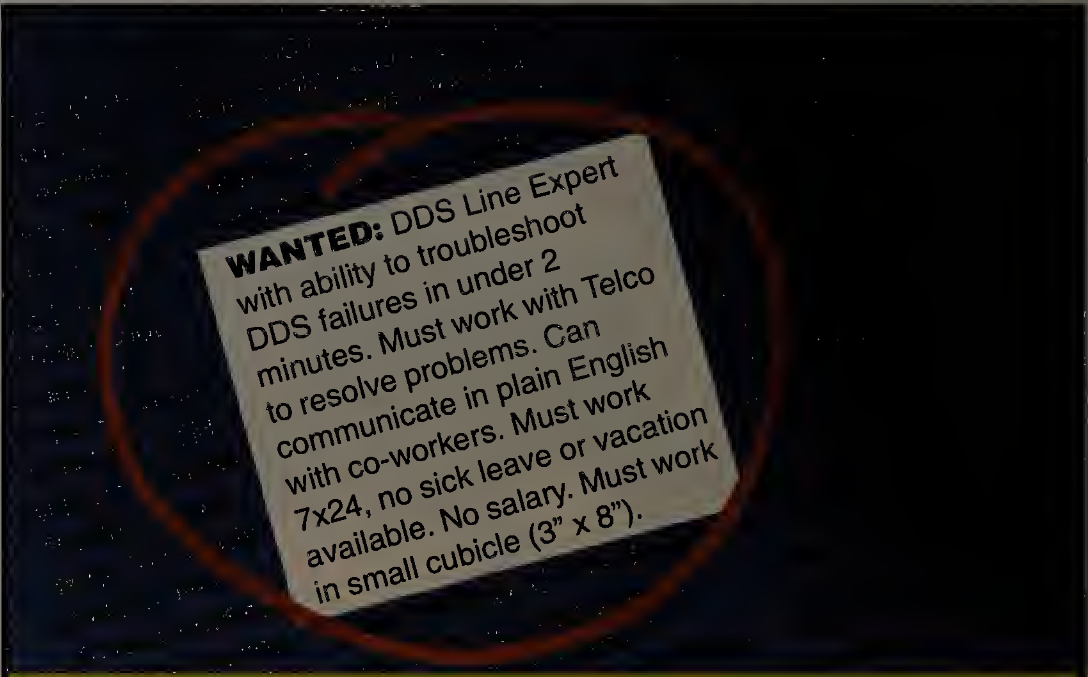

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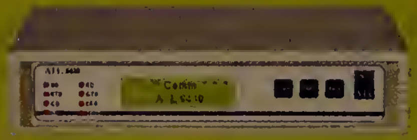

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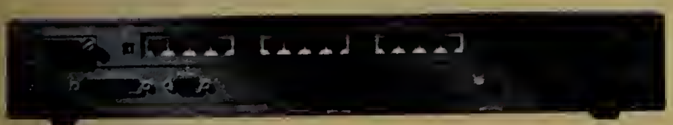

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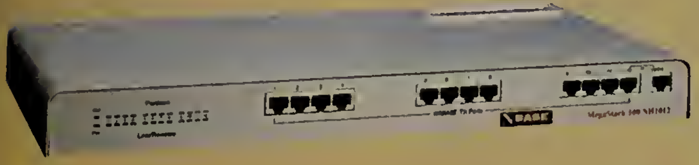

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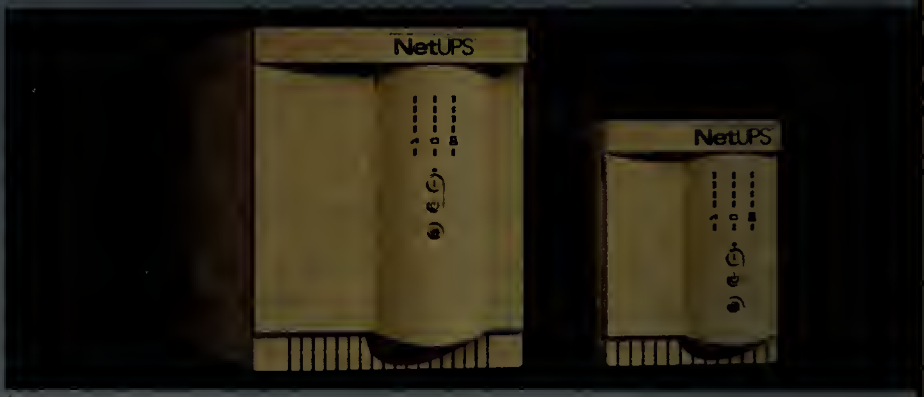

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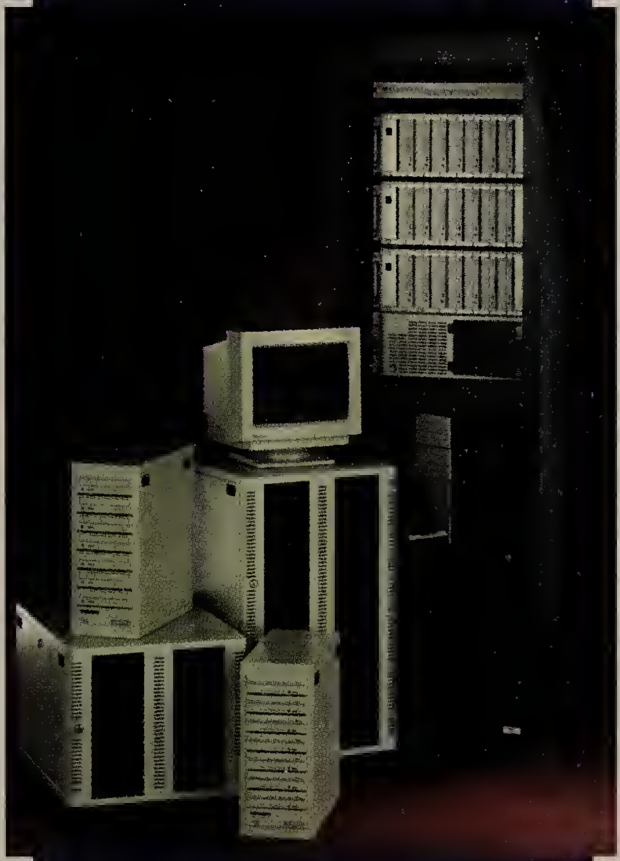

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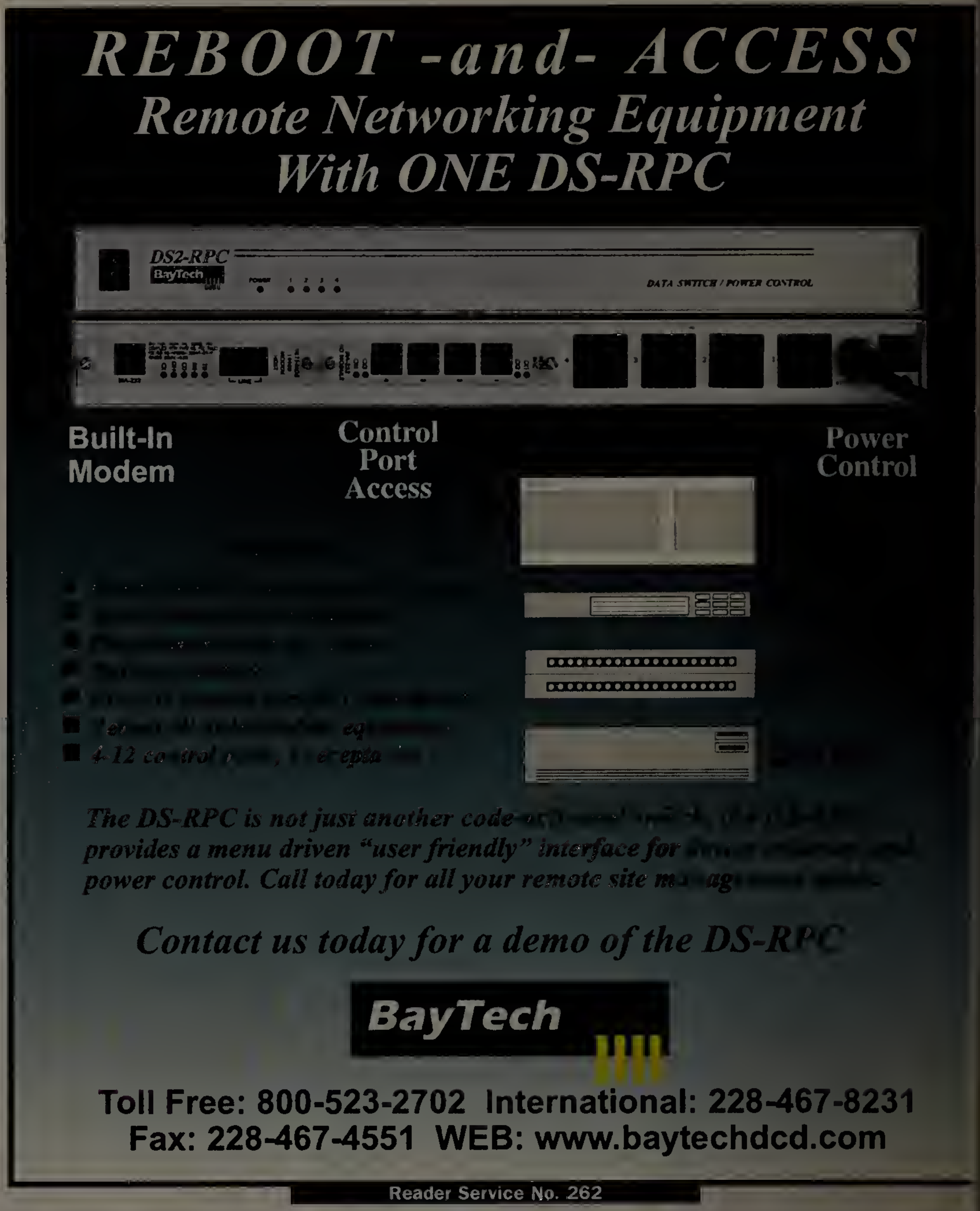

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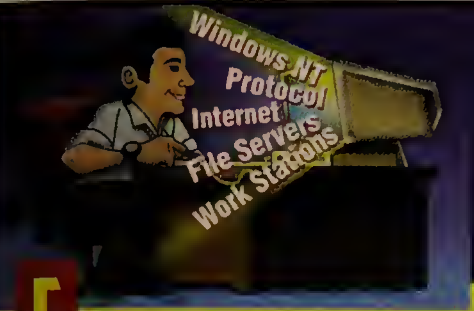

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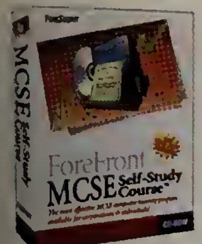

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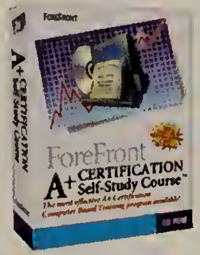

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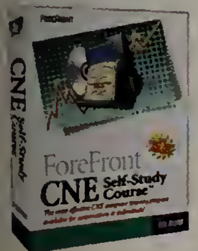

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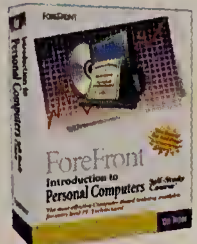

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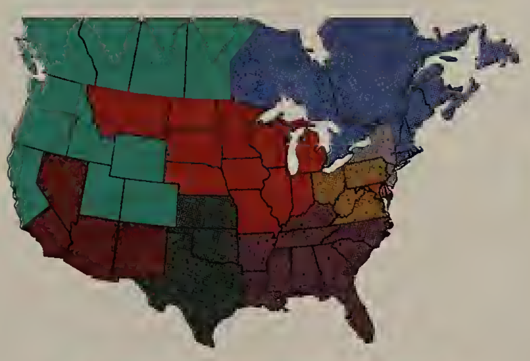

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3Com to help carrier build IP voice/data backbone

By Tim Greene

3Com Corp. last week landed a $500 million deal with USA Global Link, Inc. to help build an IP network to support cut-rate voice services and virtual private data networks.

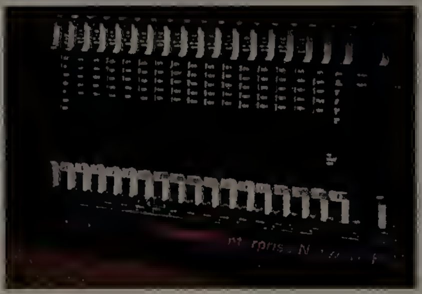
The news follows on the heels of other new carriers, including Level 3 Communications and QWEST Communications Corp., committing to use IP to handle voice and data. Even established carriers such as AT&T, Bell Atlantic Corp. and US WEST, Inc. are evaluating the long-term possibilities of building similar networks.

The touted benefits for customers are less-expensive voice services and a simple way to build IP-based virtual private networks.

But the newness of these IP networks has some users skeptical. "I question how they will prioritize traffic so voice doesn't get delayed," said Robert McKenna, vice president of Global Network Engineering for Sumitomo Bank, Ltd. Capital Markets, of New York. Sumitomo uses dedicated lines and public telephone services for voice and frame relay for data.

Buying a pure ATM service, with its standardized quality-of-service levels, seems like a better way to control performance, McKenna said.

Indeed, many established carriers plan to use ATM in the backbone supporting IP as the universal common denominator for different types of traffic.



3Com's Total Control concentrator, *with new IP voice cards and upcoming telephone signaling capabilities, is appearing in carrier IP networks.*

But for companies such as USA Global Link, which is starting from scratch, ATM may not be needed.

USA Global Link will build a network using 500 3Com Total Control access concentrators linked by fiber-optic lines. The Total Control concentrators will act as gateways to the public phone network.

Customers will dial a local USA Global Link point of presence, punch in an access code and dial the phone number they want to reach. Based on the dialed number, the Total Control box will look up the IP address for the POP nearest the destination number and route the call.

At the far end, the number will be passed off to the local phone company that will complete the call.

The rates are cheaper because any single line can carry more IP voice calls than regular circuit-switched phone calls.

The exception occurs where the USA Global Link network meets leased international trunks. There, the traffic would be converted back to circuit-switched voice.

USA Global Link's Chief Technology Officer Gary Hamm said that initially, traffic on the pure IP parts of the network will be light enough so packet delay will not interfere with voice quality.

But as traffic increases, the company may be forced to introduce an ATM infrastructure to support the IP traffic. ■

AT&T

Continued from page 1

up all over the country. According to documents obtained by *Network World*, as of Jan. 20 there was at least one hot spot in 21 states and the District of Columbia (see graphic).

An AT&T spokesman said that no orders are being rejected outright, and the company is working feverishly to provide new capacity under a revised network plan ordered by AT&T Chairman C. Michael Armstrong.

Chronic problems

But many users are reporting a chronic inability to obtain exact installation dates from AT&T account representatives.

"We're having a really tough time getting new access lines in," said Donn Greiner, a telecom analyst for United Services Automobile Association, a big insurance and financial services company in San Antonio, Texas. T-1 access circuits to AT&T are taking as long as 90 to 120 days to get installed, especially on the East Coast and in the Pacific Northwest, Greiner said. "It's hard to pin [AT&T] down to a due date and even when you do, they still miss it," he said.

The vulnerable areas typically do not include the entire state and often change, AT&T officials noted.

Some users are responding by shifting traffic to MCI Communications Corp. and Sprint Corp., both of which say they are not holding back T-1 access orders.

Last month AT&T told Carl Wood, communications and operations manager at Hudson Foods, Inc., that the company "had no facilities" to provide a T-1 access line for Hudson's Robards, Ky., site. Yet Wood had previously ordered a 512K bit/sec frame relay port for the site, and he was ready to ship equipment there. Because Hudson had recently merged with Tyson Foods, Inc. and Tyson uses MCI's frame relay service, Wood switched the order to MCI. "They turned it up in 10 days," Wood said.

Not keeping up

Among the reasons analysts suggest why demand is outstripping supply in the AT&T network:

1. AT&T's Digital Link local outbound calling program is routing local calls through long-distance switches.
2. AT&T's Access Value Arrangement and Universal T-1 Access programs provide incentives for smaller offices to order access lines directly into the network for multiple services.
3. Demand for T-3 private lines, ATM service and ISDN Primary Rate Interface from large users and ISPs is chewing up bandwidth at an enormous pace.
4. AT&T recently canceled plans for a new large core switch with Lucent and moved to an edge switch architecture that is not fully implemented.
5. Many users continue to view AT&T as the default long-distance carrier and automatically turn to it for new services.

Likewise, in late November AT&T told Union Labor Life Insurance Co. (ULLICO), a Washington, D.C.-based insurer, that it had to delay a scheduled T-1 access line installation for an affiliated insurance agency in Denver. The Denver office wanted the dedicated access line to obtain on-net rates for ULLICO's Software Defined Network, AT&T's flagship large-business voice service.

But AT&T representatives would only tell Henry Baird, a Seattle-based telecom consultant working with ULLICO, that they were attending "weekly meetings at which they decided which orders could be provisioned." The circuit was finally installed two months late, Baird said, after he appealed to ULLICO's national account team.

An AT&T representative told Wood that T-1 cards are on back order for the carrier's digital access and cross-connect system, which sits near AT&T's long-distance switches to split out traffic to different AT&T services.

"They just don't have enough terminating equipment," Wood said.

Other users say they've been told that port capacity on AT&T's core 4ESS long-distance switches from Lucent Technologies, Inc. is running out.

An AT&T spokesman confirmed that in some areas "switch hooks" on the 4ESS are gone. The carrier is ordering new ports and conducting an "asset mining" program to locate vacant ports on the switches, he said. But the problem is exacerbated by giant traffic demands on AT&T's fiber routes.

Capacity shortage

To reach the switches from AT&T's points of presence, AT&T must inverse-multiplex users' T-1 links up to T-3 and send 48 such circuits over a 2.4G bit/sec fiber path, explained Hossein Eslambolchi, AT&T's vice president of network operations. "We have a shortage of OC-48 capacity," Eslambolchi said.

To ease the load, Armstrong has ordered AT&T to begin terminating access lines closer to the edge of the network on switches from merger partner Teleport Communications Group (TCG).

He also has ordered an extensive purchase program for new local telephone and packet data switches, dropping plans for a big new core switch from AT&T spinoff Lucent (*NW*, Feb. 2, page 8).

But that strategy change is coming late in the game. Observers agreed that AT&T put itself in a hole by ramping up the sale of new T-1 access lines in 1997 to corporate branch offices that previously used dial-up access for long-distance calls, fax and switched data connections.

"I don't think there was enough coordination between the Business Markets Division and the networking organization," said Berge Ayvazian, executive vice president of The Yankee Group, a Boston-based telecommunications consulting firm. "Marketing was aggressively out selling these T-1 access lines at a time when the network people were switching from one platform to another."

While AT&T sales representatives have been out hustling T-1 access lines, customers complain that the representatives are receiving capacity-shortage information too late in the ordering process. "You get two-thirds of the way into the process and then they come back and say the facilities are not there," Wood said. "So the customer is just left out there hanging."

Other users said AT&T account representatives are growing reluctant to quote an installation interval because they fear that a hot spot will be declared in the area. "I guarantee you have a lot of sales reps who are very nervous right now," said one large Tariff 12 user who asked not to be identified. He said he has found it particularly difficult to order circuits in the Chicago area.

"We're aggressively putting in additional capacity," Eslambolchi said. "We have an unbelievable set of numbers through '98 and '99." But analysts said demand could continue to overwhelm supply while AT&T moves to close the TCG deal and implement Armstrong's edge-switch architecture.

"I think it will be rough for at least another three or four months," Ayvazian said. ■

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Notes

Continued from page 1

However, other OS/2 users and industry experts said Lotus' step away from OS/2 on the client side was inevitable and should have been anticipated.

Lotus officials have long championed the IBM operating system but called their decision part of an overall IBM/Lotus strategy to transition OS/2 users to a Java-based network computing architecture. Lotus plans to continue supporting existing versions of Notes for OS/2.

The customer flare-up comes amid a concerted push by Lotus to redefine and simplify its client strategy, with a heavy emphasis on server-centric computing and Java-enhanced browser access.

Having that strategy accepted is important for Lotus because the company is locked in a showdown with Microsoft Corp. for supremacy in the e-mail/groupware market, which includes a fierce battle for Lotus' installed base of 14 million cc:Mail users.

The OS/2 decision drew scant attention when announced at Lotus' recent customer conference, but angry protests have arisen since then in newsgroup discussions and on the grapevine.

"I'm extremely disappointed in the move [and] it also makes me feel the fool," said Tom Rowe, an administrator at the University of Wisconsin-Madison. "I've been recommending Notes/Domino to many people precisely because it didn't lock them into the Microsoft camp. Now people have little choice [but to use Windows NT]."

Notes 5.0 also will run on Windows 3.1 and 95, and Macintosh Power PC.

One customer whose shop has been running a pilot Notes installation on OS/2 said the Lotus announcement will drive his company in a different direction.

"We are dumping Notes and we are going with a pure Web-based solution that will fit more adequately in our primarily OS/2 environment," said the customer, who requested anonymity.

Some users were particularly upset by being caught off guard.

"I was at Lotusphere and there was no mention [that I heard] of OS/2 support for Notes 5.0, one way or the other," lamented one customer on a newsgroup. "I foolishly assumed there would be both a [Version 5.0] client and a designer for OS/2."

Not to worry

Lotus officials believe such discontent among OS/2 users is not widespread and will dissipate once the company's future plans for browser access to its Domino Web application server are made more clear.

"We recognize that this will cause some concerns to customers," said Paul McNulty, vice president of product marketing. "However, we are really not abandoning them."

Besides server support for Domino 5.0 on OS/2, Lotus is promising to certify the existing Notes OS/2 client for use with that server, as well as provide enhancements for that client.

"I would suggest that [those complaining] probably don't completely understand yet what we're doing with browser access," McNulty said.

There are customers buying that reasoning.

"My initial reaction was one of disgust," said Chuck Meins, a manager at Massachusetts Institute of Technology's Lincoln Laboratory. "On calmer reflection, I think that a decent Java client running on OS/2 will suit my purposes just fine."

There also are those who remain convinced that Lotus and IBM had no choice but to change course on Notes and OS/2.

"I can't see how new OS/2 client software development could possibly be cost-justified," said Joe McGinn, author of a recently released book titled *Inside Lotuscript.* "Even IBM has long since given up promoting OS/2 as a client solution." ■

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NPR

Continued from page 1

Al Gore, has failed to deliver on its promises of a unified federal procurement system and secure governmentwide e-mail.

In fact, last December the White House tossed out its earlier electronic commerce policy based on the Federal Acquisition Computer Network (FACNET) and now is scrambling to come up with a new policy by March 3, the NPR's fifth birthday.

FACNET failure

FACNET "was not a successful strategy at all," acknowledged James Bessin, financial systems policy analyst at the White House Office of Management and Budget (OMB). "FACNET was a standards-driven exercise where the government said, 'If we go with it, everyone else will, too.' "

"The business sector is fed up with platitudes about electronic commerce," Bessin added.

A team from the Department of Defense, OMB and other agencies now is reviewing a electronic commerce policy draft slated to replace the ill-fated FACNET initiative.

The General Services Administration last week awarded a mammoth P-card contract to American Express Co., Citibank, First National Bank of Chicago, Mellon Bank Corp., NationsBank and US Bank.

ON THE RISE

The federal government's annual spending on information technology has risen from $9.9 billion in 1983 to a budgeted $27 billion in 1998. But the government will have to spend between $6 billion and $8 billion over the next two years just to solve the Year 2000 problem affecting software in mainframes and other computers, according to consultancy Federal Sources, of McLean, Va.

With a potential length of 10 years, the contract could be worth an estimated $100 billion.

"We want to encourage people to use their [P-cards] with electronic catalogs," Bessin said. "And we want to use commercial software packages that are not unique to the government."

New policy

Under the new electronic commerce policy, the Defense Department is expected to be the agency responsible for registering businesses that want to sell to the agencies online.

The Defense Department also had this role for FACNET, even though the department did not do a very good job the first time around, Bessin said.

The original White House electronic commerce strategy, which Congress passed as a law called the Federal Acquisition Streamlining Act of 1994, forced the 46 federal agencies to send all their small-purchase bid information through the electronic data interchange-based FACNET.

About 30 value-added network suppliers tweaked their environments to connect to the FACNET hubs, and the businesses that wanted to electronically submit bids to the government had to subscribe to the VANs.

All of the suppliers were supposed to be using FACNET by 1999.

It was going to be "the single face to industry," a central network pumping out information on everything the government wanted to buy. But then the Defense Logistics Agency (DLA), which annually buys $9 billion worth of goods from the commercial world to resell to the defense community, rebelled against FACNET.

The DLA, which was using a different flavor of EDI than FACNET employed, did not want to migrate to FACNET.

Last September, when a Government Accounting Office report on acquisition reform said that 24 senior agency officials found FACNET to be "inappropriate, impractical or inefficient," the administration agreed to kill the FACNET mandate. ■

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THE NATIONAL PERFORMANCE REVIEW AND HOW IT GREW

March 1993 - President Clinton announces the National Performance Review, a strategy to streamline federal government procurement through electronic commerce and improve services to U.S. citizens. Vice President Gore is appointed to head the effort.

Aug. 1993 - The Government Performance and Results Act of 1993 requires agencies to submit a five-year plan by Sept. 30, 1997, on how they will deliver technology services to citizens.

Sept. 1993 - Clinton forms the Information Infrastructure Task Force to establish and implement policies and initiatives for the deployment of the National Information Infrastructure.

Dec. 1993 - Gore asks agencies to set up the Government Information Technology Services (GITS) working groups to coordinate the government's re-engineering plans.

Oct. 1994 - Federal Acquisition Streamlining Act requires all federal agencies to conduct electronic commerce through the Federal Acquisition Computer Network (FACNET).

July 1996 - Presidential executive order establishes a GITS board and sets up the CIO Council to achieve and coordinate an "interoperable, secure and shared government infrastructure."

Dec. 1997 - The administration bows to the Defense Department and kills the FACNET mandate via the Defense Authorization Bill.

March 1998 - A new electronic commerce plan is expected to be unveiled.

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Backspin

Into the Information Age ... without PDF

What is the obsession with Adobe's Portable Document Format (PDF)? You see it used all over the Internet and in all sorts of products. I've had single-page product sheets and press releases sent to me in PDF format, as well as white papers and product documentation.

The problem is, I just don't get it.

Why use PDF? The fact that an electronic document can "look" like a real document doesn't make it more valid. If it is electronic, it is electronic.

In the case of vendors, I'm at a complete loss as to why they supply their manuals in PDF. Is it laziness? Is it because they can print their documentation that is laid out for paper directly to the PDF driver rather than go to the trouble of creating a specifically electronic version?

Mark Gibbs

That doesn't make a lot of sense. The vendors could just as easily export the document to HTML, which would be generally more useful.

Just imagine if all of your vendors supplied their manuals in HTML. You could add their content to your intranet content and all of your users would have access to the manuals. You could even annotate and modify the documentation to suit your organization's needs. Nirvana!

Of course, it may be that vendors figure that their deathless prose has such great intrinsic value that the hoi polloi shouldn't be able to cut and paste it. Unfortunately, most vendor manuals are dull, pedestrian tomes that fail utterly in providing insight and added value to their product.

PDF files are a hangover, a retro technology that serves to keep us in the data age. The data age? Yep, that's what we're struggling out of. The data age was an era when just to get access to any content was an incredible step forward.

The data age view was, in its time, a reasonable and rational way of looking at the world. As the cost of computing fell to reasonable levels and software matured to the point at which it was possible to provide cost-effective business functionality, what mattered was data.

This was because the handling of data was a practical goal. We didn't have the luxury or the appreciation of information-handling tools. What we wound up with were databases and spreadsheets — tools that allowed us to manipulate the bulk of our interests rather than their essence.

Folks, we're supposed to be moving out of the data age. We're supposed to be in the information age. That's the age that recognizes meaning and purpose as a prerequisite of possessing knowledge, as fundamental attributes of that stuff we call information.

Manipulate data and you can, for example, handle your inventory or your sales.

But handle information and you find that you can optimize inventory and determine which salespeople are the most effective and why.

Without focusing on and acquiring information, the idea of electronic commerce is a mere streamlining of data processing. It's rather like taking a VW Beetle, painting racing stripes on it, and trying to enter the Le Mans. Sure, you might get in, but you'll be running an underpowered, noncompetitive machine.

So what to do about PDF? Well, if you are a vendor, think carefully before you use it. Do you have a real need for it? If you are an end user and you create PDF documents, ask yourself why. Is it simply because it is easy? Or is it because document layout fidelity is a real concern?

And if in either instance document fidelity really is a concern, is that concern based on content or layout?

I have yet to find a compelling need for document layout fidelity, but if you think you have one, please write and let me know and I'll be glad to admit I was wrong. Until then, my slogan will be "PDF. Just say no."

Send your arguments to nwcolumn @gibbs.com or speak your mind on (800) 622-1108, Ext. 7504.

'NET BUZZ

The latest on the Internet/Intranet Industry

By Chris Nerney

'NO, REALLY, WE HAVE FEELINGS FOR BOTH OF YOU' Rumors are swirling in Silicon Valley that **Microsoft** is ready to acquire former **Netscape** partner **NetDynamics, Inc.**, a start-up selling high-end enterprise servers and server tools for Web-based applications.

It makes sense. Buying NetDynamics, based in Menlo Park, Calif., would give Microsoft a strong product in the high-end enterprise market, where the software giant traditionally is said to be weak.

And the high-end enterprise market also is where Netscape, as a matter of survival, is trying to move its business.

If a deal does go through, Netscape will have only itself to blame.

When Netscape purchased **Kiva Software** in November, the acquisition was seen by some observers as a clever move. After all, Netscape was adding a highly scalable application platform to the company's growing enterprise software product line.

Unfortunately, at the time of the deal Netscape was reselling NetDynamics' application server, a direct competitor of Kiva's in the high-end market.

Talk about nerve! Talk about a high-tech triangle! Even **John Ritter** couldn't get out of this mess.

Not surprisingly, NetDynamics, which reportedly has a larger market share than Kiva, told Netscape to kiss off.

Then last week NetDynamics announced it would optimize its software for Microsoft's Component Object Model (COM) object platform. This will allow interoperability between COM and the Common Object Request Broker Architecture standard.

Now analysts are hinting that a more permanent union may be in the offing.

We say you can look for a romantic springtime wedding. And we know one two-timing browser vendor that won't be getting an invitation.

A NICE BANKROLL FOR START-UP'S DEBUT **UpShot Corp.** won't have to scrimp on the poolside bar tab next month when it joins a select few high-tech start-ups at the semiexclusive **PC Forum** conference in Tucson, Ariz.

The Web-based sales management software vendor will blow into the desert town $6.9 million richer, courtesy of a just-completed second round of venture funding.

UpShot, based in Redwood City, Calif., is one of the few new firms invited this year to the high-tech beauty pageant hosted by digerati doyenne **Esther Dyson.**

The annual PC Forum provides an opportunity for several hundred venture capitalists, analysts and CEOs to mingle, pad their expense accounts and work on that midwinter tan.

UpShot CEO **Keith Raffel** wouldn't give us many details about the company's debut product, but we do know this:

- It's a Web-based application designed to enable corporate-sales and marketing employees to access information about their customers as well as each other
- It runs on a server and is accessed with a Web browser
- It has 15 beta customers, a number Raffel says will reach 50 by March 23, when PC Forum begins
- The software will cost about $500 to $700 per seat

UpShot began in 1996 as **Lantern Technology.** Lead investors in the recent funding round were **Asset Management Associates** and **TTC Ventures.**

UpShot's initial round of funding, $2.7 million, was completed in December 1996 and came from a number of corporate and private investors, including **Compaq Chairman Ben Rosen** and **Informix CEO Robert Finocchio.**

'Net Buzz vows to remain ever faithful to its readers, especially the ones who send us their best Internet- and intranet-related news. Contact Chris Nerney at (508) 820-7451 or cnerney@nww.com.

A LITTLE PUZZLED OVER HOW TO BEST SAFEGUARD YOUR FRAME RELAY NETWORK?

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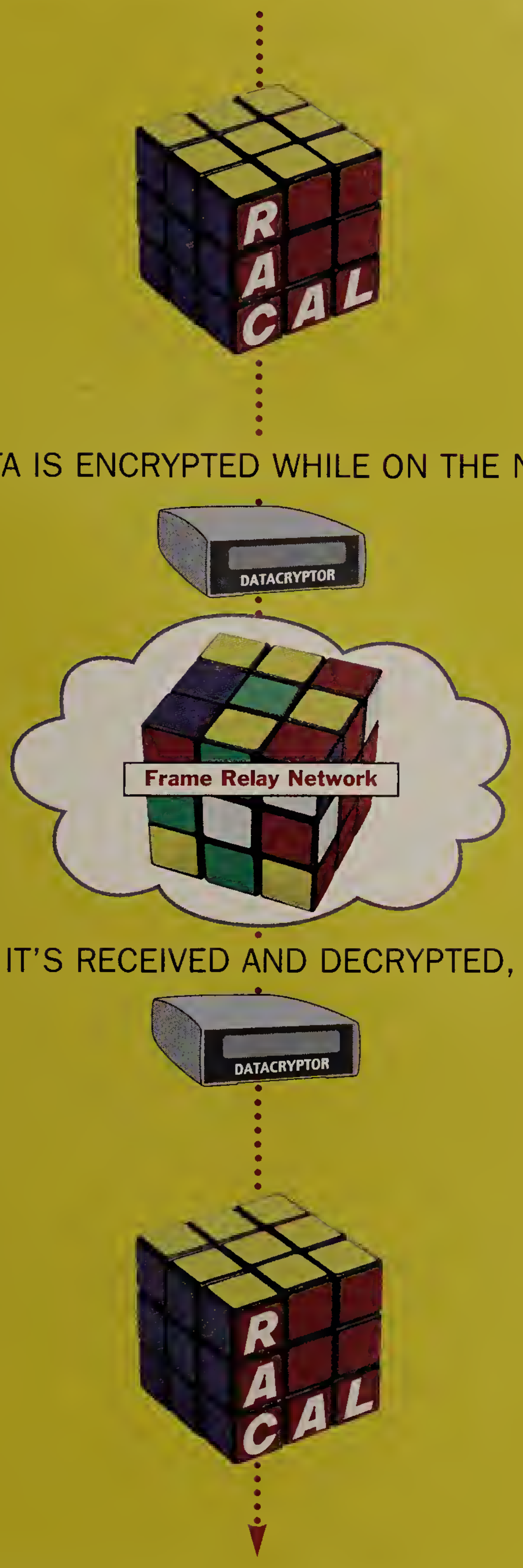

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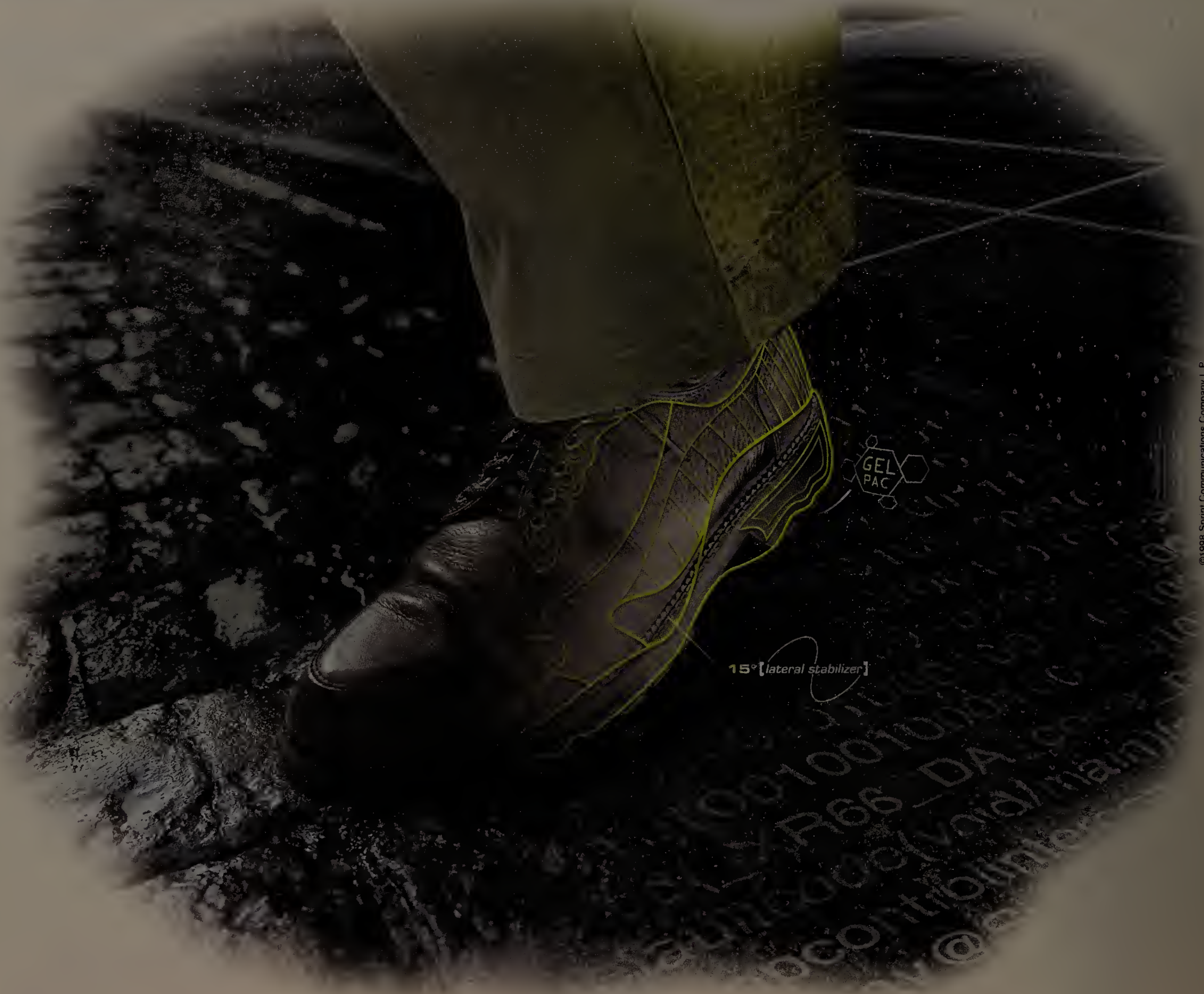

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Would you also like to receive a FREE subscription to *IntraNet* magazine? It will be a monthly magazine with content similiar to the Intranet supplement within *Network World*. ☐ YES ☐ No

Signature Date

1 What is the principal business activity at your location? (check one only)

01. ☐ Manufacturing (other)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04. ☐ Health Care Services
05. ☐ Hospitality/Entertainment/Recreation
06. ☐ Media/TV/Cable/Radio/Print
07. ☐ Retail/Wholesale Trade/Business Services
08. ☐ Transportation
09. ☐ Utilities
10. ☐ Education
11. ☐ Process Industries (Mining/Construction/ Petroleum Refining/Agriculture/Forestry)
12. ☐ Government (Federal/State/Local)
13. ☐ Military
14. ☐ Aerospace
15. ☐ Consulting (Independent)*
16. ☐ Carriers/Interconnects
17. ☐ Internet Service Provider (ISP)
18. ☐ Manufacturing (Computer/Communications/OEM)
19. ☐ Resellers of Computer/Network Products (VARs, VADs)
20. ☐ Systems/Network Integrators*
21. ☐ Distributors (Computer/Communications)*
22. ☐ Other (please specify)________________

***Please complete form based on largest client.**

PLEASE FOLD HERE FIRST ▼

2 What is your job function? (check one only)

NETWORK IS MANAGEMENT:

1. ☐ Network Management
2. ☐ LAN Management
3. ☐ Datacom/Telecom Management
4. ☐ IS, IT, MIS, CIO, Systems Management
5. ☐ Internet/Intranet Management/Webmaster
6. ☐ Engineering Management
7. ☐ Corporate Management (CEO, Pres., VP, Dir., Mgr., Financial Management)
8. ☐ Consultant (Independent)
9. ☐ Other (please specify)________________

3 What is the estimated value of Network equipment and services that you specify, recommend or approve the purchase of? (Please print the appropriate number code in the box next to each product category. Please complete ALL categories A-M.)

9. $100 Million or more
0. $50 Million to $99.9 Million
2. $25 Million to $49.9 Million
3. $10 to $24.9 Million
4. $1 to $9.9 Million
5. $100,000 to $999,999
6. $50,000 to $99,999
7. Under $50,000
8. None of the above

A ☐ Large Systems (Mainframes/Minis)
B ☐ Desktops (Micros/Laptops/Workstations)
C ☐ Servers
D ☐ LANs
E ☐ WAN Equipment
F ☐ Carrier Services
G ☐ Internetworking
H ☐ Internet
I ☐ Intranet
J ☐ Remote Access
K ☐ Peripherals
L ☐ Software
M ☐ Service/Support

4 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+ 2. ☐ 50 - 99 3. ☐ 20 - 49 4. ☐ 10 - 19 5. ☐ 2 - 9 6. ☐ 1 7. ☐ None

5 What is the total number of Servers/Clients/LANs installed/planned at your location/in your entire organization? (Check one box in each column)

At Location A	SERVERS	Entire Org. B	At Location C	CLIENTS	Entire Org. D	At Location E	LANS	Entire Org. F
☐	1. 50,000+	☐	☐	1. 50,000+	☐	☐	1. 50,000+	☐
☐	2. 10,000 to 49,999	☐	☐	2. 10,000 to 49,999	☐	☐	2. 10,000 to 49,999	☐
☐	3. 1,000 to 9,999	☐	☐	3. 1,000 to 9,999	☐	☐	3. 1,000 to 9,999	☐
☐	4. 100 to 999	☐	☐	4. 100 to 999	☐	☐	4. 100 to 999	☐
☐	5. 50 to 99	☐	☐	5. 50 to 99	☐	☐	5. 50 to 99	☐
☐	6. 10 to 49	☐	☐	6. 10 to 49	☐	☐	6. 10 to 49	☐
☐	7. 1 to 9	☐	☐	7. 1 to 9	☐	☐	7. 1 to 9	☐
☐	8. none	☐	☐	8. none	☐	☐	8. none	☐

6 What is your scope and involvement in purchasing decisions for network products and services for your enterprise?

A. Scope (check one only)
1. ☐ Corporate/Enterprise
2. ☐ Department
3. ☐ None

B. Involvement (check ALL that apply)
1. ☐ Create Network Strategy
2. ☐ Recommend/Specify
3. ☐ Approve
4. ☐ Evaluate
5. ☐ Determine the need
6. ☐ None

PLEASE FOLD HERE SECOND – SEAL WITH TAPE, NOT STAPLES. ▼

To qualify: You must supply your name, title and company name/address/phone on the business reply panel below. Please print clearly.

☐ My home is also my business address.

Optional delivery address: Enter your home address below if your company will not accept delivery at your business address.

Street Address (Home)

City State Zip

7 What is the estimated number of employees at your location/in entire organization? (check one in each section)

A. At your location:
1. ☐ Over 20,000
2. ☐ 10,000 - 19,999
3. ☐ 5,000 - 9,999
4. ☐ 2,500 - 4,999
5. ☐ 1,000 - 2,499
6. ☐ 500 - 999
7. ☐ 499 or less

B. Entire organization:
1. ☐ Over 20,000
2. ☐ 10,000 - 19,999
3. ☐ 5,000 - 9,999
4. ☐ 2,500 - 4,999
5. ☐ 1,000 - 2,499
6. ☐ 500 - 999
7. ☐ 499 or less

8 Please indicate the products/services that you are currently involved in purchasing or plan to purchase: (Check ALL that apply)

A. Currently involved in purchasing **B. Plan to purchase**

INTERNET/INTRANET
A B
☐ 01. ☐ Internet Services
☐ 02. ☐ Firewalls/Security/Encryption
☐ 03. ☐ Internet Web Servers
☐ 04. ☐ Intranet Web Servers
☐ 05. ☐ TCP/IP Software
☐ 06. ☐ Management/Monitoring Software
☐ 07. ☐ Push Technology
☐ 08. ☐ Web Browsers
☐ 09. ☐ Intranet Applications/Groupware
☐ 10. ☐ Search/Retrieval Products (web crawler)
☐ 11. ☐ Internet Development Tools (JAVA, ActiveX, etc.)
☐ 12. ☐ Electronic Commerce Tools
☐ 13. ☐ Internet Telephony

LOCAL-AREA NETWORKS
A B
☐ 14. ☐ Local-Area Networks
☐ 15 ☐ Network Operating System Software
☐ 16. ☐ Servers
☐ 17. ☐ Print Servers
☐ 18. ☐ ATM Switches
☐ 19. ☐ Token-Ring Switches
☐ 20. ☐ Ethernet Switches
☐ 21. ☐ Fast Ethernet
☐ 22. ☐ Gigabit Ethernet
☐ 23. ☐ IP Switches
☐ 24. ☐ LAN Storage/Backup
☐ 25. ☐ Optical LAN Storage/Backup
☐ 26. ☐ Disk LAN Storage/Backup
☐ 27. ☐ Tape LAN Storage/Backup
☐ 28. ☐ RAID LAN Storage/Backup
☐ 29. ☐ Network Test/Diagnostic Tools
☐ 30. ☐ Cables, Connectors, Baluns
☐ 31. ☐ UPS
☐ 32. ☐ Network Interface Cards
☐ 33. ☐ SNMP Network Management

INTERNETWORKING
A B
☐ 34. ☐ Routers
☐ 35. ☐ Hubs
☐ 36. ☐ Intelligent Hubs
☐ 37. ☐ Stackable Hubs
☐ 38. ☐ Bridge/Router
☐ 39. ☐ Bridges
☐ 40. ☐ Gateways
☐ 41. ☐ Concentrators/Repeaters

COMPUTERS/PERIPHERALS
A B
☐ 42. ☐ Network Computers
☐ 43 ☐ Laptops/Notebooks/Sub-Notebooks
☐ 44. ☐ Micros/PCs
☐ 45. ☐ Minis
☐ 46. ☐ Mainframes
☐ 47. ☐ Workstations
☐ 48. ☐ Printers/Network Printers
☐ 49. ☐ CD-ROM
☐ 50. ☐ Fax/Modem Boards
☐ 51. ☐ Graphics/Multimedia/Audio/ Video Boards
☐ 52. ☐ Memory/Chips/Boards/Cards

REMOTE/WIRELESS COMPUTING
A B
☐ 53. ☐ Remote Access Products
☐ 54. ☐ Remote Access Services
☐ 55. ☐ PDAs
☐ 56. ☐ PCMCIA Devices
☐ 57. ☐ Wireless Data Services
☐ 58. ☐ Wireless Data Equipment
☐ 59. ☐ Cellular Equipment & Services

SOFTWARE/APPLICATIONS
A B
☐ 60. ☐ Network Management
☐ 61. ☐ Systems Management
☐ 62. ☐ Security
☐ 63. ☐ Communications Software
☐ 64. ☐ Terminal Emulation
☐ 65. ☐ Operating Systems
☐ 66. ☐ Applications Development Tools
☐ 67. ☐ Database Management/RDBMS
☐ 68. ☐ Groupware
☐ 69. ☐ Workflow
☐ 70. ☐ EDI
☐ 71. ☐ E-mail
☐ 72. ☐ Desktop Video Conferencing
☐ 73. ☐ Imaging
☐ 74. ☐ Suites/Server Suites (Back Office, etc.)
☐ 75. ☐ Middleware
☐ 76. ☐ Document Management
☐ 77. ☐ Site Metering Tools
☐ 78. ☐ Computer Telephony Integration (CTI)
☐ 79. ☐ Data Warehousing

WIDE-AREA NETWORK EQUIPMENT & SERVICES
A B
☐ 80. ☐ Modems
☐ 81. ☐ Asynchronous Transfer Mode (ATM)
☐ 82. ☐ Frame Relay Equipment/Services
☐ 83. ☐ ISDN Equipment & Services
☐ 84. ☐ FT-1/T-1/T-3 Multiplexers/Services
☐ 85. ☐ DSL Services/Products
☐ 86. ☐ SONET
☐ 87. ☐ Inverse Multiplexers
☐ 88. ☐ SMDS
☐ 89. ☐ Diagnostic/Test Equipment
☐ 90. ☐ DSU/CSU
☐ 91. ☐ VSAT/Satellite
☐ 92. ☐ PBXs
☐ 93. ☐ Voice Mail/Response
☐ 94. ☐ Videoconferencing
☐ 95. ☐ Leased Lines
☐ 96. ☐ Switched Data
☐ 97. ☐ Virtual Networks
☐ 98. ☐ Outsourcing/Systems Integration Services
☐ 99. ☐ Education/Training Services

☐ 00. ☐ None of the above (1 - 99)

If there is a parent company, please provide name

If military, please specify branch and base

If government, please specify division

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9 Please indicate the platforms that are currently installed/planned: (check ALL that apply) A. Currently installed B. Planned for purchase

NETWORK PROTOCOLS
A B
☐ 01. ☐ TCP/IP
☐ 02. ☐ IPv6
☐ 03. ☐ SNA
☐ 04. ☐ DECnet
☐ 05. ☐ Novell IPX/SPX
☐ 06. ☐ APPC/APPN/LU 6.2
☐ 07. ☐ NETBIOS
☐ 08. ☐ AppleTalk
☐ 09. ☐ NFS
☐ 10. ☐ Other (please specify)________________

LAN ENVIRONMENT
A B
☐ 11. ☐ Gigabit Ethernet
☐ 12. ☐ Switched Ethernet
☐ 13. ☐ Fast Ethernet (100 Megabit Ethernet)
☐ 14. ☐ Ethernet
☐ 15. ☐ ATM
☐ 16. ☐ Token Ring/Token Ring Switching
☐ 17. ☐ IP Switching
☐ 18. ☐ FDDI
☐ 19. ☐ 100Base-T
☐ 20. ☐ 10Base-T
☐ 21. ☐ LocalTalk
☐ 22. ☐ Fibre Channel
☐ 23. ☐ 100vg Any LAN
☐ 24. ☐ Other (please specify)________________

NETWORK OPERATING SYSTEM
A B
☐ 25. ☐ Windows NT
☐ 26. ☐ Windows NT/Advanced Server
☐ 27. ☐ Novell IntranetWare
☐ 28. ☐ Novell (NetWare 4.X)
☐ 29. ☐ Novell (NetWare 2.X, 3.X)
☐ 30. ☐ Microsoft (LAN Manager)
☐ 31. ☐ LocalTalk (AppleTalk)
☐ 32. ☐ Banyan (VINES)
☐ 33. ☐ IBM (LAN Server)
☐ 34. ☐ Artisoft (LANtastic)
☐ 35. ☐ Other (please specify)________________

COMPUTER OPERATING SYSTEM
A B
☐ 36. ☐ NT Server
☐ 37. ☐ NT Workstation
☐ 38. ☐ Unix/Xenix/AIX
☐ 39. ☐ Solaris
☐ 40. ☐ Windows
☐ 41. ☐ Windows 95
☐ 42. ☐ Windows 97
☐ 43. ☐ DOS
☐ 44. ☐ OS/2/OS/2 Warp
☐ 45. ☐ IBM MVS/VM/VSE
☐ 46. ☐ Digital VMS
☐ 47. ☐ Macintosh
☐ 48. ☐ Other (please specify)________________

☐ 49. ☐ None of the above (1-48)

10 Which of the following Servers/Clients do you have installed/planned at your location? (check ALL that apply in each column)

	A. Servers		B. Clients		A. Servers		B. Clients
Power PC	☐	01.	☐	486	☐	07.	☐
Power Mac	☐	02.	☐	386	☐	08.	☐
Mac Other	☐	03.	☐	286	☐	09.	☐
Multiprocessor Servers	☐	04.	☐	Risc	☐	10.	☐
P6/PII	☐	05.	☐	Alpha	☐	11.	☐
Pentium/Pentium Pro	☐	06.	☐	Other	☐	12.	☐

11 Which of the following hardware platforms are installed/planned in your company? (check ALL that apply)

A - Mainframes (Large Scale)
1. ☐ IBM
2. ☐ Amdahl
3. ☐ Cray
4. ☐ Hitachi
5. ☐ Unisys
6. ☐ Other____________

B - Minis (Midrange)
1. ☐ IBM RS6000
2. ☐ IBM AS400
3. ☐ Digital
4. ☐ Tandem
5. ☐ Unisys
6. ☐ AT&T GIS
7. ☐ H-P
8. ☐ Data General
9. ☐ Other____________

C - Workstations
1. ☐ Sun Microsystems
2. ☐ Silicon Graphics
3. ☐ Digital
4. ☐ H-P
5. ☐ IBM
6. ☐ Other____________

12 What is the estimated gross annual revenue of your entire company/institution? (check one only)

01. ☐ $20 billion or more
02. ☐ $10 billion to $19.9 billion
03. ☐ $1 billion to $9.9 billion
04. ☐ $500 million to $999.9 million
05. ☐ $100 million to $499.9 million
06. ☐ $50 million to $99.9 million
07. ☐ $10 million to $49.9 million
08. ☐ $5 million to $9.9 million
09. ☐ $4.9 million or less
10. ☐ None of the above

13 For which areas outside of North America do you have purchase influence? (check ALL that apply)

1. ☐ Europe 2. ☐ Asia 3. ☐ South America 4. ☐ Australia
5. ☐ Middle East 6. ☐ None

Form: 9703

To Qualify, You Must Provide Your Name, Title and Business Address/Phone Here.

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Title

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